FINAL REPORT

OF THE

ADVISORY COUNCIL

ON

RODENT AND RABID SKUNK CONTROL

SEPTEMBER 14, 1973

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STATE OF MONTANA
DEPARTMENT OF AGRICULTURE

GEORGE LACKMAN
COMMISSIONER
CAPITOL ANNEX BUILDING

HELENA, MONTANA 59601

TELEPHONE:
AREA CODE 406
449-3144

October 4, 1973

Honorable Thomas L. Judge
Governor, State of Montana
State Capitol Building
Helena, Montana 59601

Dear Governor Judge:

The Department of Agriculture's Advisory Council on Rodents and Rabid Skunk Control officially completed its responsibilities according to the creation order deadline of June 30, 1973. Attached is the Advisory Council's final report, recommendations, minutes of meetings and interim legislative report.

I believe the Council has done a commendable job and has achieved its assignment as set forth in Governor Anderson's correspondence of April 25, 1972, and in the creation order. However, continued effort in the areas of rodent and rabid skunk control and evaluation is necessary. This responsibility resides in the Department of Livestock and is presently being carried by their Biologist. The Department of Livestock is continuing to consult with various state departments and citizens groups in order to maintain and develop an acceptable control program for rodents and rabid skunks, while protecting the states environment.

I certainly endorse the two resolutions on rabies and predator research passed by the Legislature and signed by you. Continued support of these resolutions by your office would be appreciated and quite helpful to the state in the future.

I agree with the Council's suggestion that an advisory council on "Predators, Their Control and Evaluation" be established in the Department of Livestock. This action would in part take the place of the Council's recommendation (Senate Bill 335) to form a specific evaluation program in the Department of Livestock.

If you or your staff have any questions concerning the Council's report or recommendations, please feel free to contact any member.

Sincerely,

George Lackman

George Lackman
Commissioner

STATE OF MONTANA

DEPARTMENT OF AGRICULTURE

Rodent Control and Rabies Skunk Control
Advisory Council
Helena, Montana

August 16, 1973

George Lackman, Commissioner
Department of Agriculture
Annex Building
Helena, Montana 59601

Dear Mr. Lackman:

Pursuant to the order creating the Rodent and Rabid Skunk Control Advisory Council, the Council submits its final report.

Respectfully,

J. Frederick Bell, M.D., Ph.D.

William G. Cheney

Robert L. Eng, Ph.D.

Gary L. Gingery

Bill C. Hicks

Peter Jackson

Thomas W. Mussehl

Vernon E. Sloulin

COUNCIL MEMBERSHIP

NAME	TITLE	DISCIPLINE REPRESENTED
J. Frederick Bell, M.D., Ph.D.	Medical Director Rocky Mountain Laboratory Public Health Service U.S.D.H.E.W.	Health
Wm. G. Cheney	Administrator Brands-Enforcement Division Department of Livestock	Livestock
Robert L. Eng, Ph.D.	Professor of Zoology Montana State University	Wildlife
Gary L. Gingery*	Administrator Pesticide Division Department of Agriculture	Agriculture
Bill C. Hicks	Rancher - LY Ranch	Livestock
Peter Jackson	Agriculturalist & Range Management Specialist Department of Natural Resources and Conservation	Agriculture
Thomas W. Mussehl	Chief of Research Section Department of Fish and Game	Wildlife
Vernon E. Sloulin	Bureau Chief Environmental Services Department of Health and Environmental Sciences	Health

*Chairman

FINAL REPORT

of the

Advisory Council

on

Rodent and Rabid Skunk Control

The Council was established May 18, 1972 "to develop a program for the control of rodents and rabid skunks in Montana, with appropriate legislation, if necessary, to be presented to the Governor and the 1973 Legislature." (Document No. 1). The Council was composed of eight individuals equally representing agriculture, livestock, health and wildlife.

The basic reasons the Council was formed were:

1.) to develop a rodent control program in Montana,

2.) to develop appropriate legislation, if necessary,

3.) to consider the establishment of a centralized rodenticide mixing plant and procedures for controlling the sale and use of such products in the state,

4.) to determine the availability and effectiveness of non-chemical agents for the control of rodents,

5.) to develop a program for continuing the control of rabid skunks in Montana on state, private and federal lands.

Events leading to the appointment of the Advisory Council:

1.) President's Executive order February 8, 1972 on predators and toxicants, the Department of Interior's subsequent actions and the banning of toxicants by the Environmental Protection Agency (Documents No. 2,3, and 4.)

2.) numerous requests from farmers, ranchers and urban residents for rodent control,

3.) proposed national legislation placing additional responsibility for control of rodents and rabid skunks on the states.

A meeting called by Doug Smith, Agricultural Coordinator, Governor's office was held April 21, 1972 to discuss the five reasons and to establish a course of action. Local, state and federal officials and various citizens groups attended the meeting (Document No. 5 - Minute of Meetings). The actions to be taken by the state were described in Governor Anderson's letter of April 25 to the directors of the Department's of Agriculture, Livestock, Fish and Game and Health and Environmental Sciences (Document No. 6).

COUNCIL ACTIVITIES:

The first Council meeting was held July 18, 1972. This meeting was an organizational meeting to establish needs and priorities of the Council. Enclosed as Documents No. 7, 8, 9, 10, 11 and 12 are the minutes of the six meetings held after July 18. The committee, in developing its recommendations, obtained considerable information from other states, federal agencies and other interested organizations. The Council also surveyed the 56 counties in Montana concerning rodent problems, needs and environmental considerations (Document No. 13).

The Council developed the attached Interim Report (Document No. 14) on Rodent and Rabid Skunk Control from all the materials received and from recommendations by specialists in the two fields. While this report mainly refers to rodents and rabid skunks, some consideration was given to predator control and evaluation programs because these are considered interrelated. The two joint resolutions recommended by the Council were passed by the 43rd Legislature and signed by the Governor. These resolutions have been sent to

Montana's delegates in Washington, D.C. and to the President of the United States. The Council recommends that these resolutions be sent to other western states for their consideration and support. The resolutions, as signed by the Governor, are attached as Document No. 15; Senate Joint Resolution No. 25 - "Predator Control Research" and Document No. 16; Senate Joint Resolution No. 26 - "National Rabies Wildlife Research Program."

The Council's recommendations to create "a state rodent, rabid skunk and predator evaluation program in the Department of Livestock to investigate, review and evaluate rodents and predators of economic and public health concern and to recommend methods of effective control having the least adverse effect on Montana's environment" was introduced to the legislature as SB 335, (Document No. 17) along with its companion appropriation bill, SB 342 (Document No. 18). The two bills failed due to lack of available state funds to implement the evaluation program.

CURRENT PROGRAMS

RODENTS - 1973

Currently the Bureau of Sports Fisheries and Wildlife has rodent baits available for use in Montana under the guidelines explained in the Interim Report. There are numerous problems in implementation of this program, because of restrictions on use and sale of the toxicants. Generally these problems have been resolved and the program is continuing. Nineteen (19) counties are participating.

Commercial rodent baits are also available in the state. While the Council recommended restriction of rodent baits, the Department of Agriculture has not implemented a pesticide regulation restricting the baits. (Refer to Interim Report for restrictions). The Council recommends adoption of a regulation prior to the 1974 control season.

RABID SKUNKS - 1973

Since March 25, twenty seven cases of rabies in skunks have been identified in Montana. Twenty-three cases have occurred in Sheridan County, three in Blaine County and one in Daniels County.

A trapping program was initiated in March, April, May and the first week of June to reduce the skunk populations in the areas where rabid skunks were found. (Rabies in skunks is determined by the Department of Livestock's Diagnostic Laboratory in Bozeman.)

Emergency funds were requested through the Governor's office, and provided by the Department of Livestock on May 3, 1973, for an emergency trapping program in Sheridan County. The Department of Livestock also began processing a request to EPA for the use of strychnine baits for rabid skunk control. The Environmental Protection Agency announced they would interpose no objection to the use of strychnine eggs on June 6. (Refer to the Department of Livestock's Impact Statement for the specifics of the strychnine bait program.) Four additional rabid skunk cases have occurred since June 6, 1973, all in Sheridan County.

The Department of Livestock has established evaluation programs on the rabies control areas in northeastern Montana. Available information indicates that this evaluation data will be valuable in future rabies outbreaks.

PREDATOR CONTROL - 1973

Predator control in Montana is still restricted to ground and aerial hunting and trapping, no toxicants can be utilized. Numerous complaints are still being received from livestock interests on coyote and/or fox depredation of sheep and some cattle.

Due to the limitation of monies and manpower, evaluation of depredation problems are extremely limited. These limitations also curtail control where it is proved necessary. The Department of Livestock will hire additional

personnel to assist in implementing an evaluation program and in controlling coyote depredation.

The Council recommends that the Department of Livestock establish an advisory council on predators, their control and evaluation in Montana. The reasons for this are:

1.) continued need for predator control relative to livestock production;

2.) possibility of national legislation being enacted in the next few years;

3.) need for maintaining acceptable environmental controls to protect our environment, and

4.) interrelationships between predators, rodents and zoonotic diseases (rabies, Tularemia).

We would also recommend continuation and extension of evaluation to the fullest extent possible in order to form a more rational basis for future actions. Possibly a bill similar to SB 335 and SB 342 should be introduced in the 1975 legislature.

SUMMARY:

The Council would like to express its appreciation to all the individuals who have assisted this Council. Some of the principal contributors are:

Norton Miner - State Supervisor - Division of Wildlife Services Bureau of Sport Fisheries and Wildlife - Box 1835 - Billings, MT 59103

Don Balser - Denver Wildlife Research Center Bureau of Sports Fisheries and Wildlife Denver, Colorado

Dr. J. Winkler - Chief Rabies Control Unit National Center for Disease Control Atlanta, Georgia

Dr. J. Craighead - Leader of the Montana Cooperative Wildlife Research Unit & Professor of Zoology & Forestry University of Montana Missoula, MT 59801

Ken Seyler	- Environmentalist, Department of Livestock
Ken Quickenden	- Vector Control Specialist - Department of Health and Environmental Sciences
Kit Walther	- Pesticides Coordinator - Department of Health and Environmental Sciences
John Hechtel	- Wildlife Club - University of Montana Missoula, MT 59801
Tina Deatsch	- Wildlife Club - University of Montana Missoula, MT 59801

and other individuals from various state and federal agencies.

The Council agrees unanimously that:

1.) A predator, rabid skunk and rodent evaluation program should be established in the Department of Livestock (See SB 335).

2.) An advisory council on predator control and evaluation should be established in the Department of Livestock.

This council should represent the disciplines: agriculture, health, livestock and wildlife.

3.) Letters supporting the rabies and predators resolution (SJR 25-26) should be sent to the western states requesting their support.

4.) The Department of Agriculture should restrict strychnine and zinc phosphide prior to 1974.

DOCUMENT #1

FRANK MURRAY
Secretary of State
By _____
Deputy

STATE OF MONTANA

CREATION, RECORD, AND GOVERNOR'S APPROVAL OF THE Rodent and Rabid Skunk Control ADVISORY COUNCIL WITHIN THE DEPARTMENT OF Agriculture.

I, George Lackman of the Department of Agriculture hereby create the Rodent Control and Rabid Skunk Control advisory council this 11th day of May, 1972.

The purpose of the council shall be to develop a program for the control of rodents and rabid skunks in Montana, with appropriate legislation, if necessary, to be presented to the Governor and 1973 legislature. Specific council directives are set forth in the Governor's letter of April 25, 1972.

The council shall be composed of individuals representing equally the following four disciplines; agriculture, livestock, health and wildlife, pursuant to the Governor's letter of April 25, 1972.

The names and addresses of council members serving at the pleasure of the Governor are:

NAME	ADDRESS
Gary L. Gingery, Chairman Administrator, Pesticides Control Division	Helena, Montana Department of Agriculture
Peter V. Jackson Agriculturalist & Range Management Specialist	Helena, Montana Department of Natural Resources
Wm. G. Cheney Administrator, Brands-Enforcement Division	Helena, Montana Department of Livestock
William Hicks Rancher	Wolf Creek, Montana
Vernon Sloulin Bureau Chief, Environmental Services	Helena, Montana Department of Health

NAME	ADDRESS
Dr. J. Frederick Bell Medical Director, Rocky Mountain Laboratory	Hamilton, Montana U.S. Public Health Service
Tom Mussehl Chief of Research Section	Bozeman, Montana Department of Fish and Game
Dr. Robert L. Eng Prof. of Zoology-Department of Zoology & Entomology	Bozeman, Montana Montana State University

The council shall exist until June 30, 1973 or upon completion of work before June 30, 1973.

DEPARTMENT HEAD

George Lackman — Commissioner, Department of Agriculture (to be changed to Commissioner of Agriculture 5-24-72)

Under the Executive Reorganization Act of 1971 (Laws of Montana, 1971, Chapter No. 272), in order for the creation of an advisory council to be effective the Governor of the State of Montana must approve the creation of advisory councils and file a record of the council in his office and in the office of the Secretary of State.

APPROVED:

DATE: May 15, 1972

FORREST H. ANDERSON, Governor

ATTEST:

Frank Murray
Secretary of State

DATE: May 15, 1972

DOCUMENT #2

OFFICE OF THE WHITE HOUSE PRESS SECRETARY

THE WHITE HOUSE

EXECUTIVE ORDER

ENVIRONMENTAL SAFEGUARDS ON ACTIVITIES FOR ANIMAL DAMAGE CONTROL ON FEDERAL LANDS

By virtue of the authority vested in me as President of the United States and in furtherance of the purposes and policies of the National Environmental Policy Act of 1969 (42 USC 4321 et seq.) and the Endangered Species Conservation Act of 1969 (16 USC 668aa), it is ordered as follows:

Section 1. Policy. It is the policy of the Federal government to (1) restrict the use on Federal lands of chemical toxicants for the purpose of killing predatory mammals or birds; (2) restrict the use on such lands of chemical toxicants which cause any secondary poisoning effects for the purpose of killing other mammals, birds, or reptiles; (3) restrict the use of both such types of toxicants in any Federal programs of mammal or bird damage control that may be authorized by law. All such mammal or bird damage control programs shall be conducted in a manner which contributes to the maintenance of environmental quality, and to the conservation and protection, to the greatest degree possible, of the Nation's wildlife resources, including predatory animals.

Section 2. Definitions. As used in the order, the term: (a) "Federal lands" means all real property owned by or leased to the Federal Government, excluding (1) lands administered by the Secretary of the Interior pursuant to his trust responsibilities for Indian affairs, and (2) real property located in metropolitan areas.

(b) "Agencies" means the departments, agencies, and establishments of the executive branch of the Federal Government.

(c) "Chemical toxicant" means any chemical substance which, when ingested, inhaled, or absorbed, or when applied to or injected into the body, in relatively small amounts, by its chemical action may cause significant bodily malfunction, injury, illness, or death, to animals or man.

(d) "Predatory mammal or bird" means any mammal or bird which habitually preys upon other animals or birds.

(e) "Secondary poisoning effect" means the result attributable to a chemical toxicant which, after being ingested, inhaled, or absorbed, or when applied to or ingested into, a mammal, bird, or reptile, is retained in its tissue or otherwise retained in such a manner and quantity that the tissue itself or retaining part if thereafter ingested by man, mammal, bird, or reptile, produces the effects set forth in paragraph (c) of this section.

(f) "Field use" means use on lands not in, or immediately adjacent to, occupied buildings.

Section 3. Restrictions on Use of Chemical Toxicants.

(a) Heads of agencies shall take such action as is necessary to prevent on any Federal lands under their jurisdiction, or in any Federal program of mammal or bird damage control under their jurisdiction:

(1) the field use of any chemical toxicant for the purpose of killing a predatory mammal or bird; or

(2) the field use of any chemical toxicant which causes any secondary poisoning effect for the purpose of killing mammals, birds, or reptiles.

(b) Notwithstanding the provisions of subsection (a) of this section, the head of any agency may authorize the emergency use on Federal lands under his jurisdiction of a chemical toxicant for the purpose of killing predatory mammals or birds, or of a chemical toxicant which causes a secondary poisoning effect for the purpose of killing other mammals, birds, or reptiles, but only if in each specific case he makes a written finding, following consultation with the Secretaries of the Interior, Agriculture, and Health, Education, and Welfare, and the Administrator of the Environmental Protection Agency, that any emergency exists that cannot be dealt with by means which do not involve use of chemical toxicants, and that such use is essential:

(1) to the protection of the health or safety of human life;

(2) to the preservation of one or more wildlife species threatened with extinction, or likely within the foreseeable future to become so threatened; or

(3) to the prevention of substantial irretrievable damage to nationally significant natural resources.

Section 4. Rules for Implementation of Order. Heads of agencies shall issue such rules or regulations as may be necessary and appropriate to carry out the provisions and policy of this order.

RICHARD NIXON

THE WHITE HOUSE
February 8, 1972

DOCUMENT #3

ENVIRONMENTAL PROTECTION AGENCY
PESTICIDES OFFICE
WASHINGTON, D. C. 20250

March 9, 1972

PR Notice 72-2

Pesticides Regulation Division

NOTICE TO MANUFACTURERS, FORMULATORS, DISTRIBUTORS AND REGISTRANTS OF ECONOMIC POISONS

Attention: Person Responsible for Federal Registration of Economic Poisons

Suspension of Registration for Certain Products Containing Sodium Fluoroacetate (1080), Strychnine and Sodium Cyanide

I.

Last spring, this Agency made a public commitment to review the status of registrations for strychnine, cyanide, and sodium fluoroacetate (1080), for use in prairie and rangeland areas for the purpose of predator and rodent control. This commitment grew out of grave concern surfaced by the reported deaths of some 20 eagles killed by the misuse of thallium sulfate.1/

This same concern caused the Secretary of the Interior to initiate a thorough review of the government's federal predator control program. An advisory committee was appointed under the chairmanship of Dr. Stanley Cain, Director, Institute for Environmental Quality and Professor of Botany and Conservation

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1/ This concern predates last summer. In 1963 the Secretary of Interior appointed an Advisory Board on Wildlife and Game Management chaired by Dr. Leopold of the University of California.

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at the University of Michigan. The report of that advisory committee was released earlier this month.

Aside from this Agency's review and the Cain findings, a detailed petition has been submitted to this Agency by several distinguished conservation groups urging that the registrations of these compounds be cancelled and suspended immediately. That petition invoked the Federal Insecticide, Fungicide and Rodenticide Act, 7 U.S.C. § 135, Section 2z(2)(c) which requires that an economic poison contain "directions for use which are necessary and if complied with, adequate to prevent injury to living man and other vertebrate animals. . .," and Section 4c which allows the Administrator to initiate cancellation proceedings by ordering immediate suspension "when he finds that such action is necessary to prevent an imminent hazard to the public."[2/]

Based on this Agency's review of the registrations of sodium cyanide, strychnine, and 1080 in light of available evidence, I am persuaded that their registrations for predator uses should be suspended and cancelled.

2/ Sponsors of the petition were: The Natural Resources Defense Council, Defenders of Wildlife, Friends of the Earth, The Humane Society of the United States, National Audubon Society, Inc., New York Zoological Society, the Sierra Club, and the National Parks and Conservation Association.

II.

The Cain group has dealt at length with the effects of the use of strychnine, cyanide, and 1080 for predator control. The report points out the extreme toxicity of these compounds, their non-selectivity, and their potential impact on the environment which "is increased by secondary hazard, accumulation in the animal, and combined characteristics of chemical stability and solubility in water." This report reconfirms the findings of the Leopold Report (see 1/, supra) that the predator control program took a heavy environmental toll.

Cyanide, strychnine, and 1080 are among the most toxic chemicals known to man. They act quickly, spreading through an entire animal crippling the central nervous system. These poisons are toxic not only to their targets but other animals and wildlife. All of these poisons have a similar pattern of use as unattended baits and are spread over vast areas of open prairie.

In the case of strychnine use against badgers, coyotes, and foxes, a tablet containing the poison is placed inside a one-inch ball or cube of bait material such as meat, lard or tallow. These baits are left along animal trails or near non-game carcasses. While instructions caution the user to cover the baits over with chips or brush to avoid ingestion by non-target animals, the Cain

Report has suggested the inadequacy of such directions.[3/]

The pattern for cyanide use differs little in pertinent respects. An explosive gun, a "coyote-getter," charged with cyanide is baited and driven into the ground. The gun is left unattended along the trail or range and is triggered when an animal pulls at the bait. In the case of 1080, carcasses of dead animals are laced with the substance and strewn to attract the predator.

Indiscriminate baiting over wide unpoliced areas poses two obvious and recognized threats to non-target animals that share the ranges as a natural habitat. The unsupervised bait is itself a potential killer of non-target range species. The threat, however, is compounded by the extremely high toxicity of these poisons, which can transform the predator carcass into a potential lethal killer of prairie animal life.

While the effects of prairie baiting are, for the most part, not documented, the Cain group has suggested the present evidence may well understate the true damage. It is appropriate to take

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3/ According to the Cain Committee, if toxicants were consistently applied under field conditions with meticulous case, it is possible undesirable side-effects might be avoided. Draft at 131. However, the Committee concludes, "It appears that the necessary high standards are not likely to be attained." (Draft at 115) The Committee found no reliably precise data is available showing the degree of predator control achieved or the possible loss that might ensue without any program.

administrative notice of the fact that isolated accidents involving wildlife are not apt to be reported. Isolated, even if routine and numerous, instances of secondary animal poisoning would not have the visibility of a wildlife "kill," nor is there apt to be an observer present as in the case of human mishap. The administrative process need not be blind to these realities. This Agency's Pesticides Registration Division has, moreover, reports of cases of alleged secondary and accidental poisoning, and recently range-use of 1080 has been suspected of killing birds, including some of our rare species.

Measured against these obvious threats to wildlife are only ill-defined and speculative benefits. The Cain Committee has noted the absence of any meaningful information on the efficacy of poison baiting, especially in relation to the economic loss caused by predators to the sheep industry. At least one state, Nevada, has estimated that the cost of predator control was ten times the value of livestock and poultry lost to predators.

This absence of any meaningful data of benefits derived from the use of these highly dangerous poisons which pose a marked potential threat to the environment renders these registrations suspect. It is now settled that the burden of proof rests on the poison. The report, moreover, specifically cites the greater selectivity of ground shooting, denning, and trapping, and the Department of the Interior is embarking on a study to determine other methods of control. Here, where it is known that alternative

methods of control exist, the registrations must be seriously questioned.

III.

In deciding whether or not these considerations justify suspension, it must be recognized that the concept of suspension is one that must evolve, and existing verbal tests are not readily translated into a decisive cue for action. The Federal Insecticide, Fungicide and Rodenticide Act, and the judicial and administrative constructions of it to date set forth only word formulas that establish a general attitude on suspension questions. Each situation must be scrutinized not only for what is involved, but also for what is not involved.

Turning to the verbal tests by which we must measure the use of these poisons, FIFRA provides that the Administrator of EPA "may, when he finds that such action is necessary to prevent an imminent hazard to the public, by order, suspend the registration of an economic poison immediately." "Public" is not to be viewed restrictively, and includes fish and wildlife, as has recently and forcefully been noted in an opinion of a federal court. See EDF v. Ruckelshaus, 439 F.2d 584, at 597. Nor does "imminent" mean that we are on the "brink" and that the harm

will occur tomorrow or has been documented.[4/] It is sufficient that reasonable men can conclude that action taken today will with reasonable certainty lead to a loss in the future and that loss will be irremediable and uncorrectable by subsequent action, and that the apparent benefits from using a chemical, pending the complete statutory review process, are outweighed by the possible harm of use during the period.[5/] Or, as the matter was put in the Agency's DDT policy statement of March 18, 1971, the type, extent, probability and duration of such injury will be measured in light of the positive benefits accruing from use of the economic poison, for example, in human or animal disease control or food production.

Bearing these principles in mind, I am persuaded that a definite hazard exists. While the mere toxicity of poisons does not, under FIFRA, render them a hazard, their degree of toxicity

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4/ "An 'imminent hazard'" may be declared at any point in a chain of events which may ultimately result in harm to the public. It is not necessary that the final anticipated injury actually have occurred prior to the determination that an 'imminent hazard' exists." Reasons Underlying the Registration Decisions Concerning Products Containing DDT, 2,4,5-T, Aldrin and Dieldrin, at 6.

5/ The cancellation proceeding involving the possibility of both a scientific advisory committee and public hearing consumes at least one year. In actual fact, these proceedings have generally taken considerably more than a year.

and pattern of use may well do so. The unattended and unsupervised use of poisons over large areas of land, by definition, poses a hazard to non-target species. The fact that label instructions contain directions for placing the baits at times and in areas least likely to be populated by non-target species and for policing them, affords slight, if any comfort. This Agency has on prior occasions taken into account a "commonly recognized practice" of use (see In Re Hari Kari Lindane, I.F.&R. (Docket #6), and has noted that the likelihood of directions being followed may affect their adequacy (see In Re King Paint, 2 ERC 1819 (1970)); In Re Stearns, 2 ERC 1364 (1970).

The hazards from the pattern of use for these chemicals is not remote or off in the distant future. The prairies and ranges are populated by numerous animals, some of which are becoming rare. At jeopardy are potentially endangered species. Each death to that population is an irremediable loss and renders such species closer to extinction.

No apparent circumstances exist to counterbalance this distinct hazard and suggest that the possibility of irremediable loss is outweighed by the harm that might occur from their nonavailability during a period of suspension. The situation might well be different were the removal of these poisons from the

market likely to affect human health or the supply of a staple foodstuff; or were there no apparent alternatives available, the balance might be differently struck. This, however, is not true.

I am hereby affixing findings of fact and an order suspending and cancelling these chemicals for use in predator control.

MAR 9 1972

William D. Ruckelshaus
Administrator

DOCUMENT #4

DEPARTMENTAL GUIDELINES FOR USE OF POISONS IN NON-PREDATORY ANIMAL DAMAGE CONTROL

The purpose of this guideline is to specify chemicals permitted and conditions under which they may be used when controlling damage caused by non-predatory mammals, birds, and reptiles on Interior Department lands or in programs under Interior Department jurisdiction in compliance with Executive Order No. 11643.

The stated policy of Executive Order No. 11643, "Environmental Safeguards on Activities for Animal Damage Control on Federal Lands, "provides specific restrictions on the use "... of chemical toxicants which cause any secondary poisoning effects for the purpose of killing...mammals, birds, or reptiles..." Further, the policy clearly states that all mammal and bird damage control programs "...shall be conducted in a manner which contributes to the maintenance of environmental quality, and to the conservation and protection, to the greatest degree possible, of the Nation's wildlife resource..."

Secondary Poisoning Effect Resulting From Field Use

By Executive order definition, a "secondary poisoning effect" occurs when a chemical toxicant is retained in a target animal in such a manner and quantity that its chemical action will cause significant bodily malfunction, injury, illness or death to non-target animals or to man when the body part retaining the chemical in question is ingested.

It is clear that the degree of toxicity of a chemical varies in accordance with its respective chemical and physical properties and with the amount and manner of its use. The degree of secondary poisoning effect caused by such toxicants will vary similarly. It is evident that some toxicants will have a "secondary poisoning effect" only as a result of gross application and consequent accumulation in the target species. Accordingly, if these toxicants are not used in such gross amounts it is permissible to use them for the control of non-predatory, depredating mammals and birds. Thus, it is within the intent of Executive Order No. 11643 that determination of a "secondary poisoning effect" must allow for consideration of amounts and methods of actual field use as well as the toxicological properties of the chemicals in question (CF, 50 Am. Jr. Statutes, 378, 382).

In summary, toxicants which have a theoretical secondary poisoning effect may be used if, in practical application, toxic concentration, bait materials, and methods of application are so controlled as to prevent adverse secondary effects to man and non-target populations.

Authorization Procedure

Since this interpretation of Executive Order No. 11643 relies heavily upon applying practical secondary poisoning effect data to field situations, it is necessary to consider use of permitted toxicants in the light of specific patterns of use and to base decisions for using these materials on sound ecological knowledge of specific habitats. Standard dose-weight pharmacology toxicity estimates should be considered as they relate to the target organism as well as to carrion feeders that can be expected to share its habitat. Since secondary poisoning hazard will vary with specific field conditions, agency directors will be responsible for assuring that adverse secondary effects to man and non-target populations will not result from field patterns of use, that such uses comply with Federal and State pesticide use regulations, and that programs proposing use of chemical toxicants are submitted as appropriate for review and approval by the Federal Working Group on Pest Management.

Toxicants Permitted for Non-Predatory Mammal and Bird Control

Only the following chemical toxicants may be used within the context of these guidelines:

(1) Non-predatory mammal control baits--baits treated with strychnine alkaloid or zinc phosphide may be used for controlling non-predatory mammal damage. Potential for secondary poisoning effects from normal uses of these toxicants are related to remnant amounts of the toxicant not degraded in the gastrointestinal tract prior to death of the target individual and are not associated with other body parts. Since baits are treated at the lowest concentration effective against target animals, the possibility of "secondary poisoning effects" occurring under field conditions is remote. However, if there is reasonable doubt as to secondary poisoning hazard, use will not be made.

(2) Bird control baits--Secondary poisoning effect tests conducted with Avitrol 200* (4-aminopyridine) and Starlicide* (3-chloro-p-toluidine hydrochloride) indicate no potential for this effect.

(3) Burrow fumigants--These fumigants include cyanide compounds, carbon bisulfide, methyl bromide, and chloropicrin. These chemicals are generally considered to have no secondary poisoning effect and since use is restricted to underground situations, the likelihood of contact with carrion feeders is remote.

* Tradenames (No common chemical names)

(4) Suffocating cartridges--These devices, when ignited and inserted into closed burrows, remove available oxygen and result in suffocation of target species. Secondary poisoning effects are not possible under these conditions.

Non-Field Use

The Executive order restrictions apply only to "field use" of chemical toxicants. "Field use" applies only to controlling damage caused by non-commensal mammals, birds, and reptiles. The order does not apply to urban bird and rodent control programs for residential, industrial, and urban facilities, including garbage dumps, communication facilities, etc.; the order does not restrict the type of chemical toxicants that can be used in these situations.

APPROVED: May 23, 1972

MINUTES

The rodent control meeting was called to order by Doug Smith, Agricultural Coordinator, Office of the Governor, at 10:05 a.m., April 21, in the Governor's Conference Room. Mr. Smith presented the reasons for the meeting which were;

1.) recent actions of the Federal Government effecting the purchase and use of rodenticides.

2.) numerous requests for assistance around the state for rodent control materials.

3.) Montana's need for developing a program to replace the Bureau of Sports Fisheries and Wildlife predator, rabid skunk and rodent control programs.

Mike Goodman, County Extension Agent from Teton County, was introduced as the first participant on the program. He spoke on "The Rodent Problem as it Effects Agriculture". He stated the major problem seemed to be the lack of information on the Richardson Ground Squirrel found in the Teton County and the Columbian and pocket gophers in other areas.

The five types of damages experienced in Teton County from rodents are:

1.) forage and grain destruction

2.) mechanical damage of irrigation systems

3.) disease

4.) mound development - difficult for machinery to operate

5.) animals breaking legs in burrows.

These factors and others affect agriculture economically, subsequently requiring continued control utilizing rodenticides.

Man has also interferred with the rodents habitat, creating artificial conditions, (overgrazing, monoculture) which may lend to increased rodent populations.

Paul Skinner, representing the Gallatin Beef Producers Association, spoke on their associations position on rodent control. A resolution prepared by the association had been sent to Senators, Representatives and other interested parties concerning the control of rodents and predators in relation to the recent federal action and the brucellosis problem in Yellowstone National Park. One of the major problems experienced in the Gallatin Valley has been the destruction of irrigation systems by rodents. Several large breaks caused by rodents cost several thousand dollars to repair in the Gallatin last year. Mr. Skinner stated that the private landowners need chemical control for their land and they need it NOW. He was also interested in the establishment of a rodenticide bait mixing station being developed for Montana.

Gary Hansen, Environmental Protection Agency (EPA), Pesticides Office, Denver, was the next speaker. Prior to his discussion of the EPA's recent actions on rodenticides, he explained EPA's development and general mission as established by Congress. Following the Presidents executive order in February restricting the use of chemical toxicants on federal lands, the EPA suspended the registration of all pesticides used to control predators. The product thallium sulfate was suspended for all uses and the products cyanide, strychnine and 1080 were suspended for use to control predators. These last three products however, may still be shipped in interstate commerce, if properly labeled, for rodent control purposes. EPA's action was taken because "the evidence indicates that these chemicals represent an imminent hazard to the public welfare through the indiscriminate destruction of our valuable wildlife resources."

EPA will be looking closely at the registration of these products for rodent control, if misuse or bootlegging occurs, it is quite likely that these products could be suspended for any use just like thallium sulfate.

Following Mr. Hansen's presentation, questions were directed to him concerning the EPA action and its implications. For example, questions concerning the terms "suspended" and "cancelled" were directed to Mr. Hansen.

A "suspension" of registration means that a pesticide registered under the Federal Pesticides Act (FIFRA) cannot be legally shipped in interstate commerce for any purpose or that it cannot be shipped for unapproved uses. Thallium sulfate has been suspended for all uses, 1080 and strychnine are suspended for predator control uses but may be used to control rodents. Suspensions are effective immediately and are based upon an "imminent hazard".

Cancellation of a federal registered product means that the product is being considered for complete or partial cancellation by the EPA. However, the companies and other parties concerned are given by law a time period to respond to the cancellation order by EPA. Companies are also allowed to request the establishment of an advisory committee to evaluate the product or to request a public hearing with EPA. Cancelled products may still be legally shipped in interstate commerce until the cancellation procedings are completed.

Mr. Hansen was also questioned on the control of rabid skunks with strychnine baits. He stated that skunks are classified as predators and therefore use of strychnine baits was prohibitive. However, there is some reason to believe that a state agency could use strychnine to control rabid skunks.

The next speaker, Jim Posewitz, Department of Fish and Game, stated that the department had been involved in animal control programs for considerable time, as an active participant, a skeptical contributor and a critic of the present program. An entirely new attitude toward animal control is needed, not just a return to business as usual. Business as usual in the field of killing animals is quite clearly no longer acceptable to most American people. This change in attitude of man's relationship to his natural environment has led to a typical or classic environmental versus economic confrontation in the areas of animal control. The federal government is getting out of the animal control business following a brief transition. If this is an over-reaction, it was brought about by the practice of attacking every unwanted plant or animal with the most lethal

chemical available, in some cases with the intent to annihilate an entire population, or perhaps even an entire species. Invariably these confrontations are resolved through some sort of environmental and economic accommodation. Finding this area of accommodation in regard to predator and rodent control is going to be difficult.

Environmentalists must recognize that withdrawal from chemicals for animal control is not possible overnight. Farmers and stockmen should recognize we will never return to the unrestricted chemical control of every plant and animal representing a nuisance or an economic handicap.

The question is no longer how to kill, sterilize, or otherwise simplify the ecosystem for our convenience, but rather how we can arrive at an accommodation between making a living from the land without totally disrupting Montana's natural systems. Montana never was and never will be a simple sea of grass or other simple monoculture. Rather it is an infinitely diverse ecosystem that derives its strength from its diversity, with all plants and animals belonging to, taking from, and contributing to its stability. Attempts to oversimplify and make disproportionate those commodities we most value threaten that diversity and consequently the strength of natural systems.

The imbalance we have created apparently can only be maintained by a practice that has suddenly become unacceptable in the field of wildlife management. It was at one time accepted that predator control was not only beneficial, but in some cases necessary, to the maintenance of abundant game populations. That particular belief has been repeatedly examined and reexamined over the years, and the preponderance of evidence indicates that predators have an acceptable and proper place within all animal populations, that they are not only tolerable, but very likely essential members of any animal community.

By the same token, we readily recognize that the relationship between domestic stock and predatory animals is not the same as the relationship between predators and wild animal populations. We further recognize that individual animals habitually attacking domestic stock must be removed.

To accomplish this end, the Fish and Game Department pledges its cooperation, while urging that we diversify the program to end our dependence upon chemical control of any animal population.

Vern Sloulin, Department of Health and Environmental Sciences, stated his department was willing to cooperate in any animal control program. The department's main concern continues to be the misuse of chemicals in the environment. Chemicals utilized today must be handled correctly, because of their potential for effecting our genetic survival. Indiscriminate use has also caused many problems throughout the environment which ultimately effects man.

Norton Miner, U.S. Bureau of Sport Fisheries and Wildlife, explained the recent federal actions effecting the bureau and provided historical information on animal control in Montana.

The executive order issued in February, 1972 established the following policy for the federal government to:

1.) restrict the use on federal lands of chemical toxicants for the purpose of killing predatory mammels or birds;

2.) restrict the use on such lands of chemical toxicants which cause any secondary poisoning effects for the purpose of killing other mammels, birds, or reptiles;

3.) restrict the use of both such types of toxicants in any federal program of animal damage control.

All such federal mammel or bird damage programs shall be conducted in a manner which contributes to the maintenance of environmental quality, and to the conservation and protection, to the greatest degree possible, of the Nations wildlife resources, including predatory animals.

In compliance with the executive order the Department of Interior, Bureau of Sport Fisheries and Wildlife establish the following rules:

1.) all bureau bait mixing stations were closed February 9, no products may be manufactured, formulated, or distributed from any bureau facilities.

2.) no further toxicants will be placed by the Bureau and his agents on any class of land for the purpose of controlling predatory animals.

3.) all baits and toxicants must be picked up, placed in storage, inventories for eventual orderly and legal disposition with cooperators.

4.) all bird and rodent control work and field tests utilizing chemical agents are suspended until a program review is completed.

Norton Miner also stated that due to the federal action, he has received an increasing number of requests from agriculturalists for obtaining the bait and for formulating their own baits. The bureau is prohibitive from providing this information to any individual. Mr. Miner indicated that baits have to be mixed under controlled conditions to insure quality products for the species to be controlled. The use of inferior products will reduce the percent acceptable of bait.

The problem of rabid skunk control was also discussed by Mr.Miner. He indicated that the cooperative federal-state program was quite successful in Montana. No repeat treatments of the baits for skunk control have been needed in any area. Bureau personnel have worked through a number of towns controlling skunks and have never experienced a problem.

Gary Gingery read a statement prepared by the Dr. Loren Bahls, Environmental Quality Council - The basic idea presented was that the council has no regulatory responsibilities or decision making powers regarding rodent or predator control. The council simply urges compliance with the Montana Environmental Policy Act by all agencies involved following the procedures described in the interim guidelines.

Gary Gingery presented the Montana Pesticides Act to the group. The act provides for control of pesticides in Montana by requiring registration of the products, licensing of commercial and governmental applicators and licensing of dealers and retailers. In addition, if the pesticides utilized for rodent control were established by regulation as restricted use pesticides, then only those individuals qualified would be allowed to handle such products. This action if enacted would also require farm and ranch applicators

to obtain a permit through examination, to use these compounds. In summary, through the Montana Pesticides Act, controls are provided for, if it should ever be necessary to implement such controls.

Bill Cheney stated that the Livestock Department was extremely interested in continuing the rodent and predator control programs in Montana. He also explained his department's past activities in the area of rodent, rabid skunk and predator control.

Following a generalized discussion by all participants, Gary Gingery, presented a plan of action. He recommended that the state attempt to place an order for the strychnine baits for all counties, one order would provide a savings to all parties concerned. The state would also be able to contact the various companies handling the baits. He also requested the Extension Service to survey the counties, through their county agents, to determine their present needs prior to ordering the bait. This proposal would be contingent on the groups acceptance of the short term plan.

The long term plan suggested by Gary Gingery, included studying and evaluating the possibility of establishing a bait mixing plant (government or private), hiring trained individuals to administer a program and develop procedures for controlling the sale and use of such products in the state. The committee should also determine if alternatives are available for non-chemical control of rodents.

Bob Rasmusson, Montana Extension Service, stated that the county agents could not handle the baits any more because of the executive order. However, the extension service would be able to provide technical and educational assistance throughout the state.

Bob Raundal, State Land Department, stated that lessees of state land determine their own needs for rodent and predator control. He stated that there were nine and one-half million acres of state land, administered by the State Land Department. He also indicated that the department would cooperate with other departments in the development and implementation of any plans.

The participants discussed the proposals presented by Gary Gingery and decided that the following plan should be initiated. Governor Anderson having reviewed this information, endorsed the plan and has subsequently directed the various agencies to implement the segments of this plan.

Following is the plan adopted by the Governor as recommended by the participants attending the rodent control meeting. (See attached letter from Governor Anderson to the respective agencies).

Enclosures:

Governor's Letter to Agencies
Montana Rodent Control Trends
Summary of Agency Actions as of May 17, 1972
Lists of Participants

Submitted by: Gary Gingery

Participants Attending Rodent Control

Meeting - April 21, 1972

Doug Smith, Chairman	Agriculture Coordinator	Helena
George Lackman	Department of Agriculture	Helena
Stanley C. Burger	Montana Farm Bureau	Bozeman
David A. Smith	Montana Wool Growers Assn.	Helena
Mike Goodman	Teton County Agent	Choteau
Gary Gingery	Department of Agriculture	Helena
Bill Cheney	Departmen' of Livestock	Helena
George I. Erickson	Farmers Union	Great Falls
Edward Lien	NFO-Mont. Cattlemans Assoc.	Helena
Mons Teigen	Montana Stockgrowers Assn.	Helena
Bob Raundal	Department of State Lands	Helena
Paul Skinner	Rancher	Belgrade
S Halversen	Equity Supply	Kalispell
R.F. Rasmusson	Extension Service-MSU	Bozeman
Malcolm Lursenden	Rancher	Choteau
h Denschen	Rancher	Winnett
William Solf	Rancher	Winnett
Gordon McOmber	Farmer-Water Board	Fairfield
Kit C. Walther	Health Department	Helena
Robert LaRue	Department of Agriculture	Helena
Tina Deatsch	Wildlife Club-Student Environ. Research Center	Missoula
Terrill Deatsch	" " "	Missoula
John Hechtel	" " "	
Ray Pratt	Asst. State Entomologist - MSU	Bozeman
Robert S. Duncan	Department of State Lands	Helena
Jerry Westen	Greenfields Irrigation District	Fairfield
Verner L. Bartelsen	Rancher	Ovando
Larry O. Wilson	Blackfoot Valley Stockmens Assn.	Ovando
David L. Bertelsen	Missoula County Ext. Agent	Missoula
Budford Rice	Farm Bureau Staff	Bozeman
John J. Baucus	Rancher	Helena
Charles "Frank" Stogsdill	E.P.A. Inspector	Helena
Clarence Walton	Rancher	Wilsall
Everett Queen	Rancher	Clyde Park
Donnell Jones	Rancher	Wilsall
A. C. Grande, Jr.	Rancher	Martinsdale
Patricia Antonick		Helena
Loren L. Bahls	Environmental Quality Council	Helena
Jim Posewitz	Montana Fish and Game	Helena
Vern Sloulin	Dept. of Health & Envir. Sciences	Helena
Gary Hansen	EPA Pesticides Office	Denver

State of Montana
Office of The Governor
Helena 59601

FORREST H. ANDERSON
GOVERNOR

April 25, 1972

RECEIVED
APR 26 1972
DEPARTMENT OF
AGRICULTURE

Mr. George Lackman
Commissioner of Agriculture
Department of Agriculture
State Capitol
Helena, Montana 59601

Dear Mr. Lackman:

This letter concerns the two-part plan established at the rodent control meeting, April 21, in the Governor's Reception Room. I would like every department involved to give immediate attention to the problems involved and attempt to resolve each issue as rapidly as possible.

The Departments of Livestock and Agriculture are directed to:

1. Obtain a source for acceptable strychnine baits; and

2. Establish a temporary distribution system throughout the state.

I am requesting that the Cooperative Extension Service provide information to the Departments of Agriculture and Livestock on the amount and types of strychnine baits needed per county. These two departments should also contact the Bureau of Sport Fisheries and Wildlife concerning this matter. I would also like the Extension Service to provide educational programs to rural and urban communities concerning the two-part plan and on the proper and safe use of strychnine baits and other rodenticides.

A progress report on this temporary program should be in my office by May 5.

The long-range plan involves several different aspects ranging from rural and urban rodent control to the control of rabid skunks in Montana. This plan must incorporate the ideas and concerns of various governmental and public interests. Any programs developed must involve the four basic disciplines: agriculture, livestock, health and wildlife, in order that Montana's environment will be protected while continuing to provide for control of rodents and rabid skunks.

The Department of Agriculture is instructed to designate a committee, representing equally the disciplines mentioned

Copy forwarded to Gay Simpers 4/26/72

above, whose duty shall be the development of a rodent control program in Montana. The chairman of the committee will be Gary Gingery, Administrator of the Pesticides Control Division of the Department of Agriculture.

This committee should develop a program with appropriate legislation if necessary to be presented to the Legislature in 1973. I would appreciate periodic reports on the committee's progress. The committee should consider the establishment of a centralized rodenticide mixing plant, and procedures for controlling the sale and use of such products in the state. Finally, the committee must determine if alternatives for non-chemical control of rodents are available.

The Departments of Livestock and Health and Environmental Sciences are directed to develop a program for continuing the control of rabid skunks in Montana. The two departments, utilizing assistance from other departments and citizens groups, should develop a plan for controlling rabid skunks not only on state and private lands, but on federal lands.

Obviously, any plan will necessitate the development of an Environmental Impact Statement. I would like your plan and the impact statement to be submitted to my office by May 19. The Department of Agriculture should be consulted on registering any chemical for skunk control and licensing of government or commercial pesticide applicators.

The Department of Fish and Game is directed to provide expertise and assistance to the development of the long-range rodent and skunk control plan with the other departments. The Fish and Game Department should be able to provide the resources for determining alternatives to chemical controls.

Montana will also continue to discuss methods for controlling predators affecting sheep production.

In summary, Montana must develop an organized program for controlling rodents affecting our food supplies and the health of our citizens, while insuring that our environment is protected from any possible adverse effects of pesticides.

Sincerely,

FORREST H. ANDERSON
Governor

cc: Honorable Gordon McOmber
Honorable Gordon Bollinger

DOCUMENT #7

RODENT AND RABIES CONTROL ADVISORY COMMITTEE

Meeting on Rabies
and the
Control of Rabid Skunks
in
Montana

August 28, 1972

The chairman, Gary Gingery, opened the meeting at 10 a.m. The specific functions of the committee, as established through the governor's office, were explained to all the participants. Dr. John Safford, administrator of the Animal Health Division, of the Department of Livestock, was then requested to present a brief history of Montana's experience with rabies and its control.

Dr. Safford stated that generally rabies was a disease that was introduced into Montana. Records show that canine rabies were experienced in Bozeman in the 1920's. Another case of canine rabies occurred in Great Falls in the 1930's resulting in a human death. In the same period a horse moving from Montana to Utah and back came down with rabies and eventually died. The horse most likely was introduced to rabies in the state of Utah. In the year 1950 or '51 a dog transported from Denver into the Billings area subsequently came down with rabies and eventually effected 12 additional dogs and two cats. Prior to this time period there seems to be no rabies cases in Montana's wildlife except for western Montana. The Rocky Mountain Laboratory in Hamilton, since 1954, has identified rabies positive bats each year in that area. However, the rabies has not been transmitted from the bat population into other species (this fact is based upon existing records and observations). The reason for this particular situation are unknown.

Dr. Safford stated that in the past the central midwest states had the only concentration of wildlife rabies. The rabies experienced in this area progressively moved westward across the Dakota's until Montana experienced its first positive rabid skunk in Fallon County in 1964. Dr. Safford said that the Livestock Departments primary interest in rabies control is to protect livestock and the Department of Health responsibility is to protect public health. These agencies obligations are the reasons both agencies became quite concerned about the rabies cases being experienced in eastern Montana in 1964-65. Meetings were held involving various groups, Livestock, Health, Fish and Game and the Bureau of Sports Fisheries and Wildlife to determine methods for preventing the spread of rabies in Montana. The selective reduction program involved the following: in an area where a rabid positive skunk or other animal had been found, a three mile control zone would be established. Within this control zone a program utilizing trapping and baiting would be used to reduce the skunk population, thus reducing the contact between skunks and other species, especially humans and livestock.

The Department of Livestock upon determining a positive case of rabies through their laboratory located in Bozeman recommends to the Bureau of Sports Fisheries and Wildlife that a specific control program is needed. Upon receiving this information the Bureau makes an evaluation of the area, carries out all the necessary methods for controlling skunks, and upon completion of this program evaluates the control achieved. In all the areas that selective skunk reduction has been carried out no additional cases of rabies have ever occurred in Montana.

In 1972 the President's Executive Order and subsequent federal departmental actions stopped federal employees from utilizing toxicants for the control of rabid skunks in Montana, especially on federal lands. Therefore, the state of Montana was required to assume this responsibility of controlling rabid skunks in eastern Montana.

Dr. Safford then asked the question; Does the selectively reduction of skunk populations in the three mile zone delay the progression of the disease westward across Montana? Dr. Safford felt that the program had been somewhat successful, however, indications are that rabies in skunks may be slowly spreading westward across the state. He stated that obviously additional study and research is needed to fully determine the effectiveness of the selective reduction program and its success in delaying the progression of the disease westward. Dr. Safford went on to say that rabies is a fatal disease to man and it presently seems possible to control the disease by reducing the animal population experiencing rabies.

Canine rabies has been controlled with the utilization of various specific vaccines. The number of canine cases of rabies have virtually been eliminated in Montana and throughout the United States in the 1960's. Possibly rabies could be eradicated in the United States following specific programs in which all species subject to rabies are protected in one form or another.

A map illustrating the numbers and locations of the rabies cases since 1964 was then presented to the group for their review. (See attachment)

Dr. Safford then presented Dr. Winkler, Chief of the Rabies Contol Unit National Center for Disease Control, Atlanta, Georgia. Following is a resume of Dr. Winkler's initial comments to the group.

The primary purpose of rabies control is to protect public health. Pasteur by developing a rabies vaccination made the first major breakthrough or development for protecting humans from rabies in the 1880's. Between the years 1885 and 1920 not many more additional breakthroughs were achieved except for refinement of Pasteur's vaccines. In the 1920's the Japanese began immunizing dogs which was quite successful and eventually proved to be good method of protecting canine population from rabbies. In the 1940's and 50's newer vaccines were introduced which assisted in providing greater protection to dogs and also in protecting humans. Programs such as reducing stray dogs and required vaccinations of canines in communities also assisted in reducing the number of cases of rabies experienced in canine and humans in this time period. 25 years ago 30 cases of rabies in humans were experienced per year, now only two cases are generally experienced. Previously rabies seemed to be a canine problem, but with the use of vaccinations for dogs this situation has now changed. Rabies is a wildlife problem in the United States now and in many other countries.

Basic research is needed to determine the ecological aspects of the wildlife species involved and the epidemiology of rabies virus in wildlife. The Bureau of Sports Fisheries and Wildlife for some 30 years has been involved in rabid skunk control. Dr. Winkler stated that he couldn't say if skunk reduction programs or animal reduction programs are acceptable or efficient due to the many unknown factors which are involved in determining success of a program. Dr. Winkler then presented a number of new techniques used to control rabies in wildlife. The Bureau of Sports Fisheries and Wildlife have been experimenting with chemical sterilants, however,

several problems have reduced the use of chemical sterilants until further data is obtained. Oral immunization of wildlife is another possibility of protecting man and livestock from the ravages of wildlife rabies. Dr. Winkler stated that it will be several years before we will know the real answer to oral immunization of wildlife to prevent rabies. Some of the problems involved with oral immunization include the following:

1. How long will the oral immunization be effective? Will it be a year or more? How much of the population will actually be immunized against the rabies and how much of the population needs to be immunized against rabies to protect all of the population? Additional problems related to oral immunization include; Making sure that the immunization procedures do not cause rabies in other species. If this were the case the present problem of rabies control would be compounded.

Dr. Winkler stated that the Cain Report reflects popular thinking today in their statement that questions the use of toxicants for controlling wild animals exposed to rabies. In the spring of 1973 it is expected that the National Academy of Sciences NAS will report on its rabies studies carried out in the last few years. There are several items within the report which will be of primary interest to many groups. The report will cover such areas as wildlife rabies, standardization of vaccinations and laws and regulations throughout the nation and administrative techniques for carrying out various types of rabies control programs. Current data on all the various types of vaccines will be presented along with exceptable methods of providing immunizations to the species involved. This report will probably indicate that wildlife rabies should not be controlled by reducing populations. This recommendation would be in reference to the control of large animal populations covering enormous areas rather than selective control programs as utilized in Montana. Dr. Winkler stated that short term control probably should be continued until additional information is obtained on the various methods of controlling rabies in wildlife. This control is especially necessary in those areas endemic to rabies and also in those areas where humans and livestock are in close proximity to the animal population which is exposed to rabies. Dr. Winkler stated that intensive research is needed to determine the efficacy of population reductions. Dr. Winkler then stated "How effective are animal reduction programs?" How about the utilization of additional techniques? The oral vaccination approach for example looks very promising today. Research has been carried out in New York utilizing coyote getters which are set up to administer oral immunization materials into fox. This program in terms of just the fox seems to be successful. Additional problems involved with other species being subject to the coyote getter has hindered the progression of this research project. Steel traps built with syringes for vaccinations have also been utilized, however, this method seems to be quite impractical at this time. The goal of oral immunization is to provide a cheap method for preventing rabies in wildlife thus protecting man and livestock. Research personnel will have to establish that broadcasting such materials for oral immunization of wildlife species will not introduce rabies into other species thus compounding the problem for man. Species that have been studied to date for oral vaccination have been fox, skunks, mongoose, racoons and dogs. The greatest success has been for the fox. Animals subject to oral immunization for rabies have developed antibodies up to ten months. Dr. Winkler stated that not enough work has been done in the area of challenging the species upon development of antibodies. Challenging is necessary to determine if the development of antibodies is significant enough to ward off the effects of the disease. Several additional problems connected with oral vaccines include:

1.) The stability of the oral vaccine seems to be limited to approximately 24 hours at this time. In those areas of the nation experiencing extreme warm weather this time period would be drastically reduced, in the winter 24 hours would probably

be the maximum time period for viability of the vaccine. Safety is a key factor in this research program for oral immunization. Vast number of species would be introduced to the possible ingestion of the material including man. The research people must insure that the baits will not cause rabies in other species. People currently doing the research in oral vaccinations will have to satisfy those people given the responsibility for preventing damage from broadcasting materials, that the material are safe and effective. The final problem would be to make sure that vaccine virus cannot change to a virulent virus in other species of animals. Dr. Winkler indicated his agency obtained the use of an island near Maine for a field study of oral vaccinations, however, due to several different problems this research study on the island cannot be carried out this year. It is hoped that it can be implemented in 1973. Europeans which have been experiencing fox rabies problems recently may try the broadcasting of oral vaccines within the next 12 months on a large scale basis.

Dr. Safford was then requested to explain the procedure for collecting suspect animals with rabies and the method utilized for determining positive cases of rabies. Dr. Safford stated that generally speaking veterinarians throughout the state will bring or send brain samples to Bozeman for analysis. The laboratory findings determine the state's action in carrying out selective reduction programs. If the species is determined to be positive for rabies utilizing various laboratory methods the State Board of Health becomes involved in order to protect public health. Laboratory standard procedure is to run a FA test on the brain. If there is an exposure to humans the FA test and mouse inoculation test are run. If there is some question as to the laboratory analysis a sample is also sent to the Rocky Mountain Laboratory to confirm the Department of Livestock Laboratory analysis. If the case involves domestic animals the Department of Livestock immediately moves to have the area involved quarantined and a dog vaccination program is initiated.

Dr. Bell then stated that it seemed to him there is better cooperation between the nations of western Europe than there is between states in carrying out a realistic program of research, investigation and control of rabies on a cooperative basis.

Dr. Winkler stated that in Europe the people generally seemed to know animals and locations better than individuals do in the United States. When they need to know where control is required the local people can pinpoint the animal populations. Europeans generally believe trapping is terrible and would never submit to such a reduction program. Europeans usually utilize den gasing, hunting or bounty systems. Den gasing seems to be the most effective method for fox control in areas endemic for rabies. Dr. Winkler stated that the Swiss utilizing den gasing have in some instances been able to reduce fox population by 80% thus providing a very efficient method for controlling rabies in endemic areas. In those areas in which den gasing cannot be used hunting is the primary method used to reduce animal populations. European countries especially West Germany, maintain a very good index of wild animals. When an animal is killed it is always recorded no matter what type animal. Europeans generally feel that control is not always totally effective, especially in those areas in which large buffer zones have been established, however, control is partially effective in reducing local populations.

Dr. Bell stated that establishment of buffer zones for animal reduction programs has not truly worked. One reason for unsuccessful buffer zone programs is the lack of interest after the initial outbreak of rabies in an area. One of the things Dr. Bell mentioned that needs to be answered is when we control animal populations, are we actually helping the disease to continue in that animal population? Study is needed to determine these facts. When animal populations are reduced what may actually be occurring is old animals are replaced with young animals which may be

much more susceptible to disease, thus the disease may become more prevalent in that specific area. In many cases the old animals have already built up an immunity to the disease, therefore, you are actually repopulating areas with more susceptible animals. Dr. Bell stated that it is also logical to assume that a 3 mile radius habitat reduction program would still be necessary until future studies can make available new methods of control. Dr. Bell stated that we know animals usually concentrate on water courses and that control over large sections of land cannot be recommended for any animal reduction program. Dr. Bell posed several other questions that need to be answered. For example - how much do we know about the effects of any animal reduction program? What are its true results and effects?

Dr. Safford said "we reply and take actions on people's reports of rabies cases which gives us an indication of possible work that must be done in the immediate future."

Dr. Bell stated that a federal employee, living in Florida and traveling to Georgia to a meeting, picked up numerous specimens of animals that had been killed along the highway in a so called rabies free area. Prior to attending the meeting this individual turned the animal specimens over to the laboratory for rabies analysis. While attending the meeting he was interrupted and asked where he had obtained the specimens because many of them were positive for rabies. He stated they were all from the so called rabies free area in Florida. This points out that our observation of rabies cases may be incidental to the actual number of cases occurring in any one community.

Jim Posewitz asked the question; Has rabies always been here and is it a matter of not observing it in the past? Dr. Bell stated, that in the Bitter Root bats may always have had rabies, but other species do not seem to be subject to rabies in that portion of the state. Dr. Safford stated that reevaluation of the whole reduction program may be needed. Dr. Safford said that chance collection of many specimens which may or may not have rabies needs to be improved in Montana. Dr. Safford also said that it is usually recommended that selective control programs be carried out to protect public health. The public demands for something to be done when rabies cases are found in any area of Montana. Population control may be necessary to reduce the exposure between humans and animals possibly having the disease. He stated that the coordination of all groups is needed and necessary in light of the federal action and its effect on state and local governments.

Bill Hicks then asked - What is the life of a rabid skunk? Dr. Winkler stated he could not say because we just don't know enough about the disease in rabid skunks. Dr. Winkler went on to say that the life of a skunk experiencing rabies is usually quite variable.

Dr. Winkler than referred to a problem - rabies in racoons in southern Florida moving towards the Georgia area and into the Pan Handle of Florida. He stated that the rabies cases seemed to be traveling approximately 40 miles a year. He stated that due to other circumstances CDC had been monitoring the racoon population north of the area positive for rabid racoons. Initially this racoon population was seriologically negative for the rabies virus and as the disease seemed to progress northward, they began to pick up more and more seriological positive racoons.

Ken Sayler then stated that in the rabies cases in northeastern Montana they had set up control areas over a very short two week period to help evaluate their control program. Ken stated that the evaluation, while quite interesting, was of such a short nature that a complete evaluation of the programs was impossible.

Dr. Winkler then pointed out that CDC does sponsor grant moneys for investigating various phases of wildlife rabies.

Ken Sayler then asked Dr. Winkler - had he challenged any of the species in his study on oral immunization of foxes? Dr. Winkler, stated - none of the species had been challenged enough to be significant to date. Tina Deatsch, member of the Missoula Wildlife Club asked Dr. Winkler the following: Will the President's ban cause increased rabies in wildlife? Dr. Winkler said that this is difficult to determine, however, the Bureau will most likely be spending considerable sums of money in researching the effects of this ban on rabies and its control in the future. The chairman of the committee then established a series of questions and requested each individual to comment on these questions for the records. Following - are the questions. (1) Do you believe Montana's rabies control program should be continued in its present form? (2) What additional aspects should be included? (3) What is your opinion on the use of toxicants for rabid skunk control? (4) Wha- can your agency do in the area of research or study?

Jim Posewitz, Fish and Game Department, stated the following: Diseases in wildlife are usually density related. He questioned if reducing animal populations accomplishes the original goal of controlling the disease? Methods of control using toxicants or other materials will not make any difference in terms of the effects on that animal population. Jim then stated that the control of animal populations doesn't seem to be the real answer. Then he commented that he would be interested in knowing - how does rabies function in natural populations? He stated that he is not convinced that controlling rabid skunks with the use of toxicants or any other method is necessarily correct. Tom Mussehl of the Fish and Game Department made the following statements to the various questions. Tom stated that in trying to stop one case of rabies, what are the future implications of future cases being established in that area? We don't actually know. We should stop talking eradication of populations and possibly talk about slight suppressions of population when necessary. We actually may be increasing the incidence of rabies by using either system of suppression or eradication. Tom said that there had been no real ecological studies on animals associated with rabies. Montana's 8 years of experience in turning out research has been through funding from the federal government. All this money from guns and ammunition has gone to the research of big game animals. Steve Bayloss stated that there had been only 2 cases of human rabies in the United States in 1971. He stated that he would like to know the true economic loss in terms of what we are now spending for animal rabies control. Basically he felt that his opinions were similar to Jim Posewitz's and Tom Mussehl's.

John Hechtel than asked if younger animals were less resistent than older animals. Dr. Bell answered by saying that in most cases older animals had more resistence than younger animals to disease.

Dr. Bell was then asked to comment on the four questions. Dr. Bell referred to the Cain Report which in summary said that we have yet to prove by controlling animals population that we can actually control the disease. We need to know the epidemiology of the disease. Some of this work has already been done in the Wildlife Research Center in Denver. There are problems in establishing buffer zones that lead to ineffectual programs and more answers are needed for justifying the killing of the species involved. Rabies is a specific disease per species per area of the nation, killing off older resistent animals than replacing them with younger animals does not seem the logical approach. Dr. Safford then stated, we do some good especially in reducing the exposure to humans. Dr. Safford said that we have effectively controlled other diseases in domestic animals, and felt it was possible to effectively control rabies in wildlife.

Kit Walther then answered briefly the three questions. Basically he stated that there are lots of unknowns that needed to be answered. The public demands some control. Kit stated that he basically concurred with the statements made by the Fish and Game personnel and Dr. Bell. Dr. Kairys, Epidemiologist, Department of Health, stated the following: Physicians traditionally don't know much about animal rabies. A lot of pressure is placed upon Dr. Safford from physicians when there is a rabies outbreak in the area. Immunization in domestic animals is of importance because the disease is fatal to man. Rabies is a community problem and a public health problem and a very difficult problem due to many communication problems. Dr. Kairys stated that the Department of Health supplies of rabies serum was extremely low and the vaccine is difficult to obtain. Dr. Winkler then stated the reason for the shortage of serum supplies.

Tina Deatsch then presented the following question: Do rabies control programs only appease people yet do not solve the original problem? Dr. Winkler stated that human vaccinations or inoculation of serum for rabies in humans is still extremely painful, but the vaccines do not cause as many problems as they did in the past. He stated that 30 to 35,000 people are treated per year and that rabies is an important disease on the basis of the number of treatments.

Doug Smith asked - are there more cases than are actually reported on rabies in Montana? Dr. Winkler said yes - this is a good possibility. Ken Sayler stated that each time he puts out baits he questions his own actions because of the possibility of secondary poisonings. Ken then listed several things which he believes are important. (1) the development of a good educational program - especially in new areas where you need to carry out a program. Establishing county committees of some form would be extremely helpful in educating the public on rabies control. Possibly a five-mile radius for educating people should be established around each rabies case. People should be told what to look for and how to turn samples into the laboratory for analysis. (2) toxicants should be used in populated areas because of the immediate exposure to the human population, however, he felt that toxicants did not need to be used in unpopulated areas where the exposure to humans was somewhat reduced. Evaluation should obviously be built into any type of program. (3) study and research are needed now using such things as radio telemetry and utilizing college graduate students for general studies.

John Hechtal than asked if rabies itself control up to 50 percent of a population, how about the other 50 percent - have they been exposed and what is their status - are they more resistent or would they eventually experience the disease and die? Dr. Winkler stated that the remaining population is generally immune to the disease. Tina Deatsch then asked - how much money is needed for research? Dr. Safford stated that any research study should be done on a national basis and not on a state basis. Tina then asked if the state should administer the program. Dr. Winkler then stated that he agreed that all studies should be on a national level, especially research, should be on a national level. Bill Hicks then stated that since it seems to be livestock versus rabies, when an outbreak occurrs we should do everything to control the animals involved to protect livestock and human health.

Doug Smith then commented that the advisory committee seemed to be doing a fairly good job. Possibly we should look forward to the development of legislation if needed. Especially grants within the Departments of Fish and Game, Health and Livestock to research the area better. We may need to develop a better monitoring system. Doug stated that Dr. Safford is in a delicate position because of the demands placed upon him for rabies control. The extension service should be involved for education.

Dr. Winkler then stated he generally supports Montana's current program, however,

we really don't know if its good or bad or what it really does. Montana seems to have sporadic cases or transient cases moving in from other areas. If these are transient cases then it is extremely desireable to control rabies outbreaks. He also stated that he thinks Montana is experiencing more rabies than is reported. If a case experienced now could generate an epidemic he is not quite sure - we would need better answers. He stated that progress has been made in the areas of rabid skunk control and what we are doing is not necessarily the proper answer. However, there is not much more we can do at this point but wait for answers from research. Dr. Winkler stated the use of toxicants is probably all right under certain special conditions. Dr. Winkler then talked about economics in terms of the effects of the disease. Personally he stated no good dollar values have been established to date on the effects of rabies to the economy. He did state 300 to 400 head of cattle are effected per year in the United States. That 30,000 plus people take the treatment at about $100 per treatment per year. Fourteen to fifteen million dogs and cats are given vaccinations per year. Just these figures alone would be quite substantial in terms of economic effects. He stated that we need to standardize vaccine programs. We need to know more about non-target species. For example, the Europeans kill quite a number of badgers in their gas dening programs.

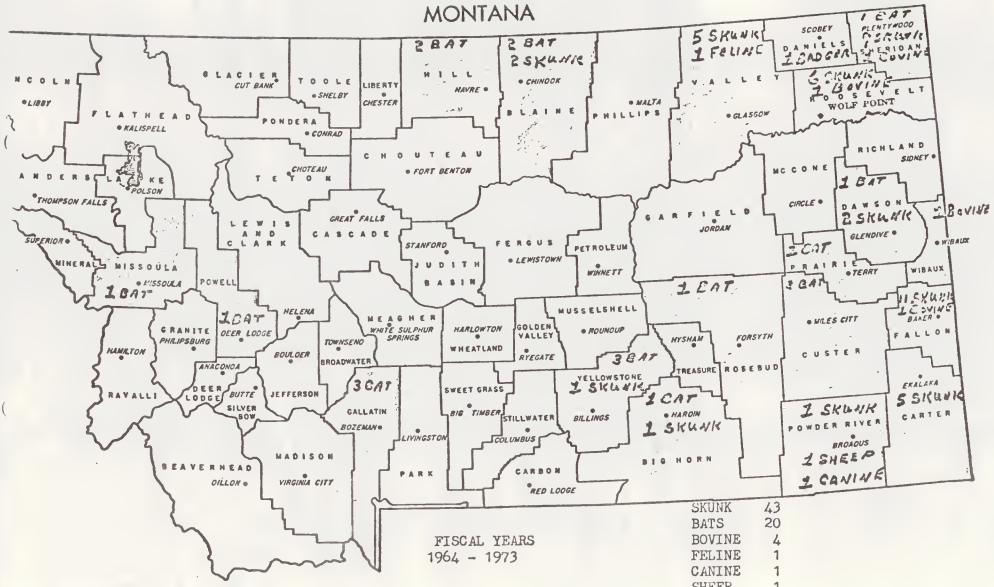
The meeting then adjourned.

The following people attended the meeting:

Committee members:

Gary L. Gingery, Chairman	Department of Agriculture
Kenneth Seyler	Department of Livestock
Jeanne Baluka for Pete Jackson	DNRD, Conservation Districts Division
Bill C. Hicks	Montana Stockgrower
Tom Mussehl	Fish and Game Department
Dr. Fritz Bell	Rocky Mountain Laboratory - Hamilton
Kit C. Walther	Dept. of Health & Environmental Sciences
Dr. John Safford	State Veterinarian
Doug Smith	Ag Coordinator - Governor's Office
Jim Posewitz	Fish and Game Department
Steve Bayloss	Fish and Game Department
Dr. William G. Winkler	CDC - Atlanta, Georgia
Dr. Ken Quickenden	Dept. of Health & Environmental Sciences
Dr. Steven Kairys	Dept. of Health & Environmental Sciences
John Hechtel	University of Montana Wildlife Club-Missou
Tina Deatsch	University of Montana Wildlife Club-Missou

MONTANA



SKUNK	43
BATS	20
BOVINE	4
FELINE	1
CANINE	1
SHEEP	1
BADGER	1
TOTAL	71

No. 1052 — County Outline Map
STATE PUBLISHING COMPANY
Helena

DOCUMENT #8

RODENT AND RABIES EVALUATION COMMITTEE

Meeting on Rodents and Their Control in Montana

September 13, 1972

COMMITTEE MEMBERS:

Kit Walther	Department of Health
Tom Mussehl	Department of Fish and Game
Ken Seyler	Department of Livestock
Dr. Robert Eng	Montana State University
Dr. Fritz Bell	Rocky Mountain Laboratory
Gary Gingery	Department of Agriculture

PARTICIPANTS ATTENDING MEETING:

Norton Miner	Bureau of Sports Fisheries and Wildlife
Bob LaRue	Department of Agriculture
Doug Smith	Agricultural Coordinator Governor's Office
Tina Deatsch	Wildlife Club - Missoula
Mr. Deatsch	Wildlife Club - Missoula
John Hectel	Wildlife Club - Missoula

MEETING:

The Chairman, Gary Gingery, opened the meeting at 10 o'clock, prior to discussion of the rodent situation in Montana. Mr. Gingery covered the necessity of preparing environmental impact statements for long term and short term rodent control programs. Mr. Gingery stated that the distribution of the bait earlier this year may require an impact statement and most likely it should be done in conjunction with the long term environmental impact statement. He stated that the product utilized was a federally registered product and under the Montana Pesticides Act this product must be accepted for registration, which means ultimately accepted for use in Montana. Therefore, an impact statement on the compound itself would not be prepared because of this requirement of Montana law. The impact statement would, most likely, not cover such areas as the use of the compound in Montana, but just distribution. In relation to the long term impact statement, it is believed that the committee or the agency responsible will be required to prepare an impact statement and that this statement should cover as many aspects as possible in the area of rodent control in Montana. He requested the Departments of Livestock and Health to continue their work on an impact statement for skunk reduction in relationship to rabies in Montana. In addition, members of the committee were requested to provide any studies or information they may be available which can be incorporated into an impact statement on rabies or rodents. The Chairman then introduced Norton Miner, State Supervisor of the Animal Control Program, Bureau of Sports Fisheries and Wildlife. Mr. Miner had been requested to present a brief history on rodent control in Montana, information on present problems, and future ideas in terms of manpower and economics required to carry out future rodent control programs.

Mr. Miner stated that rodent control was first started by the Bureau when they established their office in Montana in 1915. Records from 1915 to 1935 had been lost or destroyed; therefore, records are only available from 1935 to the present. Mr. Miner stated that in the 1920's and early 1930's eastern Montana was heavily infested with prairie dogs. The 1934 Annual Report makes the following comments: $63,800 was used to carry out an eradication program of prairie dogs in southeastern Montana. 149,000 pounds of poison bait was used over 450,000 infested acres. It was estimated that 9 million prairie dogs were killed at the time. There seemed to be approximately 20 prairie dogs per acre. This program helped to improve range land for cattle by increasing its carrying capacity by 65,000 head. In 1949 to 1963, $20,000 a year from the general fund was budgeted within the Department of Livestock for rodent control. The Rodent Control Program was conducted in cooperation with the Bureau of Sports Fisheries and Wildlife. A revolving fund was established and supervisors were hired to supervise crews in 4 or 5 counties in most cases. The supervisor also carried out inspectional add evaluation work. In 1963 the legislature failed to appropriate the $20,000.

Mr. Miner then presented some information on rodent control for the years 1952 through 1971. Following is this report prepared by Mr. Miner outlining man years, funds, supervised acres and pounds of bait expended or used per year. Mr. Miner then presented the following memorandum he had prepared for rodent control cooperators, April 29, 1971.

All Field Rodent Control

	No. Lbs. Strychnine Bait	No. Lbs. 1080 Bait
F.Y. 1971 (thru 3/31/71)	15,400	8,056
F.Y. 1970	45,750	7,067
F.Y. 1969	39,050	1,771
F.Y. 1968	29,375	1,513
F.Y. 1967	37,135	1,030
F.Y. 1966	29,630	9,782
F.Y. 1965	17,680	19,887
F.Y. 1960	14,350	11,799
F.Y. 1955	8,265	28,178

PRAIRIE DOGS

	No. Lbs. Strychnine Bait	No. Lbs. 1080 Bait
F.Y. 1971 (thru 3/31/71)	500	2,632
F.Y. 1970	3,800	1,328
F.Y. 1969	5,150	- -
F.Y. 1968	3,300	70
F.Y. 1967	1,700	220
F.Y. 1966	3,020	1,151
F.Y. 1965	900	4,480
F.Y. 1960	1,400	4,037
F.Y. 1955	2,600	20,091

Supervised Prairie Dog Control Program

	Acres Treated	Cost	Estimated Total Acreage
F.Y. 1971 (3/31)	11,006	$ 3,590.25	
F.Y. 1970	6,978	3,523.12	
F.Y. 1969	- -	- -	
F.Y. 1968	175	102.50	139,160
F.Y. 1967	2,075	1,099.47	115,980
F.Y. 1966	8,195	2,941.13	103,320
F.Y. 1965	21,111	11,371.85	
F.Y. 1960	62,298	15,605.60	186,894
F.Y. 1955	152,149	27,903.50	456,447
F.Y. 1950	261,715		785,145

Mr. Miner also presented information he had prepared on rodent control in Montana for the Environmental Defense Fund. Following is the full text of this report for your information.

Dr. Bell presented information on a treatment program for meadow mice in Oregon utilizing zinc phosphide in which many other types of species of animals were killed, including one fifth of the known population of Ross Geese. Dr. Bell then asked if Montana experienced the same types of problems with zinc phosphide. Mr. Miner stated that zinc phosphide has recently been used successfully for controlling prairie dogs in Montana and that non-target killoffs have not been experienced. Mr. Miner stated that 1100 pounds of zinc phosphide mixed with oats and 500 pounds of zinc phosphide mixed with wheat were used in Montana for Microtus Control in 1971. Mr. Miner then referred to the safety program in relationship to the Oregon meadow mouse control program. Much of the work in Oregon was not supervised; some ranchers utilized manure spreaders, some used pick-ups and just poured the grain bait out from the back of the pickup, both methods caused some damage to non-target species. Mr. Miner indicated that under proper application and supervision deaths do not result in other species or they are very minimal in relationship to the total program.

Doug Smith then asked Mr. Miner if there was a relationship between the number of predators and the prey. In other words, do predators control prey? Mr. Miner said, no, in actuality prey establishes in part predator populations. Coyotes do not control rodents.

Mr. Mussehl mentioned that predators may in a sense help to limit rodent populations to a degree; however, there are many factors that have to be brought into consideration and this has not been done in Montana. Doug Smith then asked why there was such a large rodent population this year. Mr. Miner stated that the rodent populations increased because of habitat improvement and there had been no pressure of organized control since 1963. Tom questioned, if Montana was experiencing excessive populations of rodents, and asked how was the basic data on status of populations obtained this year. Doug stated that most of his information came from comments of people around the state. Norton Miner stated that in Custer and Big Horn counties supervised prairie dog control had not been carried out for ten years. Previously every ranch would be covered every two to three years, which gave excellent control. A number of ranchers in this area reported the following to Mr. Miner: A prairie dog town on one ranch now covers four sections of land, on another ranch 700 acres are infested with prairie dogs and on a third ranch a very small colony with a limited number of animals has spread to a hundred acres in the last three or four years. Mr. Miner stated that he had not actually seen these situations himself, but hopes to look into this matter. Mr. Miner stated that not enough money or manpower is available now to control rodents which effect the states grazing lands or other prime agricultural lands in Montana.

Doug Smith also commented that in drought years farmers seemed to be more cognizant of rodent damages because of the increase of total damages caused by the drought, rodents and other factors. Dr. Eng mentioned prairie dog colonies on the CMR Refuge in northeastern Montana. He said that the colonies are currently being studied by the Bureau. Control of prairie dogs on the refuge had ended in the 1950's. There are currently 28 prairie dog towns on the refuge. Von Seyler said he would look into their research program and report back to the committee.

Mr. Miner made the following comments concerning future control operations: He believes that nearly all rodent control compounds should be restricted, especially strychnine and zinc phosphide compounds. The Chairman was asked to comment on the pending federal pesticide bill and the Montana Pesticides Act in relationship to restricting some rodent control compounds. According to the proposed Federal Pesticide Act, Senate Agricultural Committee version, it would require that all individuals handling restricted compounds, established by the federal government, obtain a permit. This permit could probably only be obtained through attending a training course and showing compentency by examination. In Montana this would mean that approximately 16,000 farmers and ranchers would have to obtain a permit to handle restricted use compounds such as the rodenticides. Under the Montana Pesticides Act, provision is made for restriction of compounds by passing regulations as established within the act. Mr Miner stated that at least two day training sessions should be held, one day in class and one day for infield work.

Mr. Miner then presented the new guidelines on the operation of bait mixing plants for the federal government. Enclosed is a copy of the memo to the various Bureau District offices on the status of rodent baits being sold out of Pocatello Supply Depot. Mr. Miner stated that he felt a state and federal program should be developed.

Dr. Bell asked the question, are predators effected by controlling rodents, is this increasing the predation problems? Mr. Miner stated that two to three acre control on a very large ranch or farm will not effect predation or should not effect predation. Several members mentioned the use of diethylstilbestrol in controlling meadow mouse populations and possibly other rodents.

The Chairman, Mr. Gingery, then asked the committee members for their opinions on the restriction of rodenticides, is restriction necessary, and under what conditions should restriction be required.

Kit Walther, Department of Health, stated that his primary concern was indiscriminate use by the public. Kit said that the demands by the public may actually not fit in with the true situation of requiring rodent control in any section of land. He did believe that the compounds should be restricted. The compounds should be under the supervision of government employees and that private control of rodents is not in the best public interest.

Tom Mussehl stated that he was concerned about secondary effects of the compounds and wondered what was happening to non-target species coming in contact with the chemicals. Tom wondered how the compounds were to be used, how they would be supervised.

Dr. Eng stated yes, that he believed restriction is necessary. Dr. Eng also stated that he is interested in determining why eruptions of rodent populations occur. Dr. Eng said that professional people must definitely be involved in any program. Some restrictions must also be placed on these people who will be controlling the restricted compounds. Any program must be controlled even with professional people supervising the program because of the possibility of professional people stimulating greater and greater budgets and manpower just to carry out the functions of the programs.

Ken Seyler stated that we should treat each species as a separate animal. There may be a difference in economic loss in each species. Research is definitely needed in a rodent control area.

Doug Smith felt that distribution should be controlled and that the user should be restricted but it should be done in such a way that adequate rodent control can still be carried out.

Dr. Bell stated that careful control, licensing, training and supervision is necessary. He felt that people handling the toxicants should be covered by bonding or some form of liability and all toxicants should be restricted.

Pete Jackson was highly concerned about the economic aspects of rodent control. He stated that land owners, farmers and ranchers, were number one environmentalists. They are well educated. Their time is valuable and they do not want to spend enormous amounts of money to eradicate rodents but need to control those rodents in areas effecting them directly. They need professional advise and consultation. Large control programs must be carried out by the state or federal government. Research is needed in this area. People who sell the compounds should also be a source of information. Agriculturalists are environmentalists of the highest order.

Norton Miner said that he is concerned that a crash program will be developed which will not provide for long term control. He believes this would be quite dangerous. The committee also discussed the distribution of rodents in Montana. The committee will attempt to obtain the booklet "Mammals in Montana" prepared by Hoffman.

The Chairman, then stated that he was interested in obtaining recommendations from the committee on rodent and rabid skunk control and hoped to obtain such recommendations by the following meeting. Committee members then asked the Chairman to prepare an outline of areas that recommendations were needed for distribution at the next meeting.

The meeting adjourned.

DOCUMENT #9

DEPARTMENT OF AGRICULTURE'S

ADVISORY COUNCIL COMMITTEE ON RODENT AND RABID SKUNK CONTROL

MINUTES OF THE MEETING ON

OCTOBER 10, 1972

MEMBERS PRESENT:	Dr. Fritz Bell
	Bill Cheney
	Dr. Robert Eng
	Gary Gingery
	Pete Jackson
	Tom Mussell
	Vern Sloulin
ABSENT MEMBERS:	Bill Hicks
GUESTS:	Terrill and Tina Deatsch
	Bob LaRue
	Norton Miner
	Ken Seyler
	Dave Smith
SPECIAL GUEST:	Dr. Don Balser Denver Wildlife Research Center Bureau of Sports Fisheries and Wildlife

The committee approved the minutes of the last two meetings concerning rodents and rabid skunk control. Following general comments by committee members, Mr. Norton Miner was introduced. Norton Miner is the State Supervisor, Division of Wildlife Services, Bureau of Sports Fisheries and Wildlife. Prior to the meeting the Chairman had requested Mr. Miner to attend and present information on predators and their control in Montana. Following are Mr. Miner's comments:

Mr. Miner stated that six years ago the Bureau employed 32 fieldmen, 4 district supervisors, and an assistant in Billings. Presently, the Bureau employs 18 fieldmen, 3 district supervisors and at the time of the meeting the assistant's position had not been filled in Billings.

Mr. Miner then stated that due to the President's Executive Order, banning toxicants for predator control and subsequent related federal actions that the Bureau in Montana did not have the capability to stay on top of the problem of sheep depredation by coyotes. The Bureau is only allowed to use rifles and steel traps to control coyotes. Neither of these tools provides complete control. For example, steel traps cannot be used in all areas of the state, such as in the Flathead. In this area most land holdings are small. Thus, traps can usually only be utilized on the lands of those individuals experiencing damages and not on neighboring lands. In addition, traps have to be maintained on a regular basis. It is feasible to utilize aircraft in many sections of the state; however, in areas of heavy brush and timber, aircraft is not successful. Helicopters in heavy timbered areas are not successful and are too expensive.

COMPARISON OF COYOTE KILLS - July through September 1971 & 1972

YEAR	AIRCRAFT TIME	AIRCRAFT COST	NO. OF COYOTES KILLED
1971	480 hrs.	$7,800	306
1972	875 hrs.	13,000 (Fixed wing)	626
	39.8 hrs.	4,577 (Helicopter)*	45
		TOTAL COYOTES KILLED 1972	671

*NOTE: Aircraft utilized in Beaverhead and Madison counties.

Mr. Miner said that earlier this year sheep producers in Beaverhead and Madison counties were experiencing a serious predation problem and requested the Bureau to declare an emergency. The Vigilante Wood Growers and State Wool Growers groups provided the basic data on the situation and requested three things from the Bureau. These items were the use of M-44, additional Bureau manpower and time to control the coyotes. Bureau personnel surveyed the area and met with wool growers in two counties and with various state representatives to discuss the situation. The Bureau finally decided that an emergency declaration would not be issued. The Bureau did comment on additional manpower and time to help alleviate the problem.

The problem in this area generally involved depredation of sheep moving from winter range to forest summer ranges, resulting in the situation of continually moving into new coyote populations. The producers were experiencing heavy losses and continued to experience heavy losses even after the Bureau spent considerable time trying to control the coyotes. In the fall the sheep were moved from summer ranges down into valleys; again new coyote populations were experienced plus, coyotes followed the sheep onto winter ranges compounding the problem.

Twenty-three sheep producers in this area have 56,400 head of sheep and indicated the following losses due to predators:

1093 ewes

2880 lambs

It resulted in a loss of $100,814. The Livestock Department and the Governor's office became involved in this matter and continued to communicate with various personnel in Washington, D.C.

Mr. Miner stated that with limited snow cover the Bureau's work is considerably easier in these two counties. However, with extensive snow cover the Bureau's success is quite limited.

Since 1971 there has been a reduction of 330,000 head of sheep in the state, at the rate of a 15¢ per head, county funding has been reduced by $12,000. District 1, which makes up the central portion of Montana, had a reduction of 37,500 head of sheep. District 2, eastern Montana, experienced a reduction of 28,800 and western Montana, District 3, experienced a reduction of 13,900. With this reduction and subsequent loss of $12,000 the means to support one fieldman in Montana was lost.

Dr. Eng asked if this reduction was a result of selling out or just a general decline of sheep numbers among all producers. Mr. Miner indicated that the reduction was due to both; going out of business and reduction. Dr. Eng then asked if producers are going out of business, if it meant reduced operations for the Bureau. Mr. Miner stated the same area had to be covered and that the acreage per Bureau man is increased. Mr. Miner stated that three men handle the Bureau's operation on the highline from Glacier to the North Dakota border, north of the Missouri. Because of the extreme size of the area too much time is spent traveling in comparison to the time needed to properly trap. Norton Miner also inferred that if the Bureau cannot handle the coyote

problem that the problem may be transferred from the sheep industry to the cattle industry. Mr. Miner indicated that cattle depredation has been greater this year than in past years; however, exact figures are not presently available. Dr. Eng asked if this would truly affect the cattle industry. Mr. Miner said, yes, one loss of a 450 pound calf by a rancher causes quite an economic loss.

The Bureau's present budget is:

$90,000	Department of Livestock
40,000	Department of Fish and Game
161,800	Bureau of Sports Fisheries and Wildlife
86,997	Mill levy on livestock
$378,797	TOTAL

Bill Hicks then stated that there seems to be a difference in the big game populations in the Wolf Creek area due possibly to increased coyote numbers. Tom Mussell stated that a situation of this type cannot be answered now and the Department of Fish and Game would need several years to evaluate coyote depredation on wildlife.

Mr. Miner then introduced Don Balser, Chief of the Denver Wildlife Research Center, Bureau of Sports Fisheries and Wildlife. Prior to the presentation of his materials, Dr. Balser felt that a few terms should be defined in the area of research. He stated that applied research is not the best because it is not basic enough to provide solutions for the problems involved. He stated that basic research is the essential ingredient because the results can, in most cases, be directly related to applied research. Dr. Basler also stated that basic research should only be carried out with an interdisciplinary team.

To develop new control methods in the area of predation, several questions should be asked:

How is the true animal depredation evaluated?

What are the various problems involved?

How do you measure the problems?

What can you utilize to provide controls?

Dr. Balser presented a list of priorities which must be studied now to completely understand predation in the United States. These priorities were set forth in part by the Leopold and Cane reports:

1. What are the future population levels of livestock in the U.S.?

   Will there be decreases or increases?

   What are industries projections?

The Bureau was currently obtaining information on present and estimated future populations from the U.S.D.A.

2. Damage assessment.

Don stated that it is very difficult to determine actual damages by coyotes and also to control coyotes because they are one of the most adaptable species of wildlife. One of the major items to be investigated is the carry-off and burial phenomenon of carcasses by canines. For example, one study in the western United States, involving 800 sheep, came up with the following information:

35 - sheep killed by coyotes

2 - by other causes

32 - unaccounted for

The individuals running the study could not account for the 32 sheep, thus a complete understanding of losses by predators or other factors could not be determined. What if the other 32 losses were due to predators, that would certainly indicate the severity of predation.

3. Management Practices of Agricultural Industries.

Proper land use

The movement of animals through many different predator populations.

Don stated that the agricultural experimental stations are working in the area and will continue to obtain data on land management.

4. Depredation control.

How to prevent losses from occurring.

The Executive order concerning the use of toxicants and the utilization of non-lethal methods has created new problems for producers in the area of depredation control.

5. Predator prey population dynamics.

6. Predator prey studies.

Livestock

Game

Non-Game

Impact on predators versus prey and visa versa.

Predator effects on predators.

7. Rabies.

Fear of rabies

Human stress

The National Academy of Studies will release a report in 1973 on all aspects of rabies and its control.

8. Social economic data.

Presently there are no good scientific methods to obtain acceptable data.

What is the economic value of coyotes in natural systems?

This list of eight priorities are the areas which must be investigated now to provide more complete answers for the protection of livestock populations from predators.

The Wildlife Research Center has established a priority system for these eight categories:

Priority A: Damage Assessment
Depredation

Priority B: Predator prey population dynamics
Predator prey studies

Time schedules for completion of these studies are listed below:

Damage Assessment - 3-5 years

Depredation - indefinite

Predator prey population dynamics - 20 years

Predator prey studies - 20 years.

Some of the problems involved in studies of this nature, include man's insufficient senses; thus, adequate data is difficult to obtain. Ecosystems are difficult to interpret.

The priorities for funding are rated as follows:

Damage Assessment 4.0

Depredation 3.5

Predator prey population dynamics 3.0

Predator prey studies 2.0

To carry out studies of this nature will involve millions of dollars. Such agencies as A.R.S., N.I.H., N.S.F., Universities, Agricultural Experimental Stations and the Bureau of Sports Fisheries and Wildlife will be involved. Don stated that some answers will come rapidly, while some will be very difficult to obtain in the eight areas of investigation. He felt that the current interest groups are against control and not necessarily the methods of control.

Dr. Balser stated that the Humane Society would definately like to knock out the use of the steel trap. He also brought out that coyote populations can vary by 100 times in the state of Texas as determined by the Bureau studies in the last few years.

Dr. Balser then presented information on a predator survey being conducted n 17 western states. The Bureau, utilizing commercial attractants, has established observation lines covering many different habitats in each state. The purpose of the survey is to determine coyote levels. The study was initiated this year to obtain a bases following the banning of toxicants for predator control. This survey will also provide information on the levels of other carnivores.

Some of the items to be accomplished are:

1. Determining the relative abundance of large versus small carnivores.

2. Mapping the range of the animals.

3. Relative densities.

4. Probable levels in relationship to ecosystems.

5. Sheep production areas and sheep losses can then be superimposed on a map illustrating population levels of predators.

Dr. Balser continued by stating that livestock depredation is not always directly related, but may be based on the learning capabilities of coyotes and their progeny. Don explained the value of using such research methods as T.V., video tapes and the use of telemetry devices on both sheep and coyotes. These methods can be used in many different ways. Dr. Balser presented several problems in carrying out field research with men:

1. The Biologist may disturb the ewe-lamb relations.

2. He may disrupt depredation.

He also presented information on coyote mortality studies being carried out in Idaho and Utah. A mortality transmitter has been attached to 50 coyotes, 40 juveniles and 10 adults. The transmitter is activated upon death of the animal. One transmitter presently has been thrown and one coyote has died.

Don concluded his presentation with the following comments:

As you remove a species in a niche it is replaced by another species, if the breeding stock is available. Toxicants did more to release various species than they did to reduce specific populations.

Hybridization is occurring in the east between coyotes and dogs, but it is not occurring in the west.

Depredation could be controlled by changing innate characteristics of the coyote with drugs thus reducing its adaptability.

Enclosed with these minutes are two publications provided by Dr. Balser.

The meeting was adjourned.

DOCUMENT #10

DEPARTMENT OF AGRICULTURE'S

Advisory Countil on Rodent and Rabid Skunk Control

Minutes of the meeting October 31

MEMBERS PRESENT:	Dr. Fritz Bell
	Bill Cheney
	Dr. Robert Eng
	Gary Gingery
	Pete Jackson
	Tom Mussehl
	Vernon Sloulin
MEMBERS ABSENT:	Bill Hicks
SPECIAL GUESTS:	Dr. John Craighead
	Dr. W. J. Dorward, Veterinarian Animal Disease Research Institute Lethbridge, Alberta Canada
	Dr. Nelson Entomologist Animal Disease Research Institute Lethbridge, Alberta Canada
GUESTS:	Steve Bayless
	Joe Egan
	Tina Deatsch
	Ken Greer
	John Hechtel
	Bob LaRue
	Norton Minor
	Ken Quickenden
	Ken Seyler
	Dave Smith

All the guests attending the meeting were introduced prior to Dr. Craigheads presentation. Dr. Bell introduced Dr. Craighead, who made a presentation on Predator Prey Relationships. Attached is the text of his presentation. Following Dr. Craighead's presentation Dr. Bell made the following comments: If predators don't get the prey, disease will. Dr. Bell mentioned a study involving Snowshoe rabbits and cottontail rabbits. Initially, the Snowshoe population seemed to be infected with a disease referred to as shock disease, possibly caused by an adrenal drain. The Snowshoe population naturally infected with ticks was experiencing tularemia, however, the tularemia in that population could not account for the degree of kill off being experienced. The cottontail rabbit in the same area eventually also began experiencing tularemia. The tick population on the Snowshoe rabbit had no where to go following the die off and crossed over to the cottontail rabbit which caused a substantial die-off. Dr. Bell than asked Dr. Craighead - What is your concept on the limitation of skunk populations? What regulating mechanisms control skunk populations? Dr. Craighead stated the following: What eliminated carnivores? Predation of one kind or another is not an effective elininating factor. A large number of regulatory mechanisms eliminate various animal populations. One individuals evaluation of these mechanisms is biased by his own training. That is why a team approach should be utilized in carrying out research of regulated mechanisms. Disease is important, predation and other factors briefly mentioned today may also be important or not important singularly or in competition with other factors. Skunks may be eliminated by such processes as starvation, reduction in food, high population levels, disease, territorially and other factors all lend themselves to controlling skunk populations. Dr. Eng asked: Does removal of one carnivore make room for another? Dr. Craighead stated: The areas where coyotes are controlled, bobcats may increase. This increase is subject to available foods. Dr. Eng then asked: Is it significant to control rodents in any specific time of year, for example when should voles be controlled. Dr. Craighead then stated: If an individual is to control the species such as voles, then the best time for control is when only the breeding population is present. For example, voles will begin to experience population increases spring through fall. There are many voles which could be termed as surplus population which will die before the next breeding season. Once the population has gone through winter and just prior to breeding again, a nucleus breeding population is present if you reduce this population you are also reducing the breeding population which will reduce generally the overall yearly population of the species involved. Dr. Eng stated: If there are more animals then a habitat can support, then this surplus may fluctuate greatly until the habitat stabilizes. There was a general discussion around the table by those attending to define the terms surplus vs non-surplus animals. The discussion continued along the lines of limiting populations by various mechanisms. Dr. Craighead stated that voles may be controlled in the fall due to disease and at other times of the year, other mechanisms will effect the population. Ken Seyler then asked Dr. Craighead to present his position on rodents, the economic concerns versus the environmental concerns. Ken stated: Can control be continued on rodents causing economic damages while still conducting research? Dr. Craighead stated that we need basic research programs now. Dr. Craighead then stated there are some things that can be learned from control programs if they are set up properly. A survey of the population can be made, an assessment of habitat conditions and the numbers taken by various methods can be determined. He stated that we should try to obtain as much data from control programs for biological and economical reasons. Questions such as the following can be asked and evaluated. Has vegetation increased with control or would the vegetation have increased even if you had left it alone? What are the reasons that regrowth or revegetation occurred? Cr. Craighead then stated that ranchers have asked him if rodents should be controlled.

Dr. Craighead indicated that he couldn't give them a proper answer immediately because a system to evaluate economic losses had not yet been developed. Tina Deatsch then asked Dr. Craighead - if the answer for range lands experiencing rodent damages, could it be solved by taking the livestock off the range? Dr. Craighead then stated that it is possible by reducing the livestock population, forage will be increased, however, removal of livestock may provide a better habitat for the rodents (lack of competition) thus increasing the rodent problem. Vernon Sloulin stated that he felt it would be essential in any rodent control or evaluation program, to have a team approach so that all factors can be accounted for in the final evaluation.

Dr. Craighead then stated his position on the use of toxicants to control rodents. Dr. Craighead stated toxicants should not be utilized over large areas and that control programs utilizing such products must be continually evaluated. The use of toxicants may be necessary in areas experiencing economic damages. He said the most important item to determine, "Is the poison the best method to utilize?" "Is it even necessary to use them?"

Dr. Dorward was then asked to explain Alberta's program on rabies. Following is the text of his presentation: Rabies as a disease is under the guidance of the federal government in Canada. Alberta established a central committee representing several disciplines which have enacted a program set forth below: Alberta utilizes a three-mile eradication program similar to Montana's. Alberta has also established a buffer zone along the border of Alberta and Saskatchewan to prevent enter of a rabid skunk into Alberta from Saskatchewan. Alberta utilizes strychnine pellets and shooting to control rabid skunks. Dr. Dorward also indicated that distemper had been found in some skunk populations in southern Alberta. Dr. Dorward states from the years 1965 through 68 that most rabies cases were found southeast of Regina and since that time have crept slowly westward. Dr. Craighead asked if the development of an effective vaccine would eliminate the necessity for controlling rabid skunks.

Bill Cheney then presented a preliminary draft, environmental impact statement, prepared by the Department of Livestock on rabid skunk control in Montana. The impact statement was reviewed page by page by the various participants. The committee recommended various alternations, deletions or additions to the statement. Following the complete review of this statement, it was decided that the Department of Livestock should review the statement for possible presentation at a future meeting.

The meeting was adjourned.

PREDATOR PREY RELATIONSHIP

Presented by Dr. John Craighead, October 31, 1972, to the Advisory Council on Rodent And Rabid Skunk Contro

In nature, animal populations are controlled by natural regulating mechanisms. This is so because the reproductive abilities of animals ordinarily exceed the capacity of the environment to support the annual increases. Population regulating mechanisms such as disease, starvation, emigration, territoriality, adrenal exhaustion, and predation have evolved as life evolved; they are intricately meshed. They do the job of control superbly well. They do it well because they are highly complex responses to the total environment.

To evaluate man-conceived control programs, we must know how population regulating mechanisms work and how each mechanism such as predation or disease is related to all other population depressants. We know a little about these intricate relationships but much more information is needed if we are to scientifically answer such questions as:

1. Should predation be controlled by reducing predator populations?
2. Should depredations by rodents be controlled by reducing rodent populations?
3. Should rabies in wildlife be controlled by reducing predator populations?
4. How effective or ineffective are man-conceived and operated animal reduction programs?

Do they attain the objectives for which they were devised and what side effects if any do they have within the ecosystem?

These are obviously very difficult questions to answer partly because we do not have sufficient knowledge of the dynamics of wild populations and partly because animal control programs, that have been conducted by various agencies over the past 40 years or more, have seldom been evaluated or appraised with scientific data. Almost without exception, they have been self-sustained operations without self-appraisal. The results have been expensive both in dollars and in animal life; and the beneficial results, especially of massive killings are highly questionable.

A basic question that confronts us is: Can man devise population controls that are as effective as natures? To shed some light on this question, I will attempt to discuss what we know about the dynamics of predation. In order not to stray too far afield, I'll confine my discussion largely to predation by raptorial birds (hawks and owls). My objective will be to attempt to show some of the complexities involved in answering the questions I have posed.

Research has disclosed that predation by hawks and owls is a very complex natural phenomenon and that full understanding of predation as a biological force could not be obtained by studying single individuals or species of predators and prey. (Example: Mc Atee, Stoddard and Errington) Investigation had to be shifted to an entire community. Many inter relations rather than only a few have to be measured and evaluated. (Analysis of 5,185 stomachs economically good and bad).

Visualize a farm, a favorite hunting site, or any stretch of familiar woods and fields, and imagine it multiplied to the size of a township (36 square miles). On this area are cottontail rabbits, meadow voles (a species of mouse), small birds, Bob-whites, Ring-necked Pheasants, fox squirrels, and other small animals. These, taken as a whole, are the prey population. (Errington - tried to correlate a raptor food habit with numbers and vulnerability of prey). On the same area are Cooper's Hawks, Red-tailed Hawks, Sparrow Hawks, Horned Owls, Barn Owls, and many more, making up the raptor population. Each form of hawk or owl is adapted by value of size, flight habits and hunting techniques, to take a limited number of the prey forms inhabiting an area--no one raptor species can catch and kill members of all the varied species of the prey community, but the raptor population as a whole can do so. (Diurnal noctural) residents migrants - general feeders, restricted feeder.) How then does this collective population of raptors interact with the collective prey?

The activities of hawks and owls on a large land area form a pattern of the dynamics of predation. The raptors must seek and capture their own assortment of prey in order to live; some of the prey must escape in order to survive, reproduce, and in turn furnish food for the raptors. The various elements of this relationship combine to cause an aggregate effect that is biologically and economically important.

To evaluate raptor predation as a force regulating animal populations, we become concerned with how many prey animals are killed in relation to how many are present or available to the predators. Studies have shown that raptor predation operates according to a definite pattern. This was determined by systematically counting raptors, recording the size of prey populations and relating raptor and prey populations to what the raptors captured and ate. From this and other data, it was concluded that:

A collective population of hawks and owls hunts the prey of any large area in such a way that each prey species or group tends to be taken in proportion to its relative density. This applies in spring, summer, fall, and winter and can be expressed in numbers: if meadow voles for example represent 90 percent of the total prey available to raptors, white-footed mice five percent, small birds four percent, and game birds one percent, then meadow voles, white-footed mice, small birds, and game birds will tend to represent 90, five, four, and one percent respectively of the collective raptor kill. The regulatory effect is quite evident here since the most abundant prey groups absorb mortality in proportion to their abundance and the proportional reduction tends to give each specific prey population a fixed density in relation to all others in the prey community.

In evaluating the regulatory effect of raptor predation, it is important to emphasize the difference between "surplus" and "non-surplus" prey animals. Animals starting into a new annual breeding cycle will be referred to an "non-surplus". These animals are the ones that will produce the next generation. They are not expendable but vitally necessary to the integrity of the populations. A greatly simplified composite example may clarify what I mean: Let us assume that a population of 300,000 meadow voles in fall has been reduced to 30,000 by late winter, a 90 percent reduction. This we know can happen. Raptors account for a minimum of 80,000 of these or 27 percent of the mortality. This too we have measured and know can occur. Disease, mammalian predation, starvation, inclement weather, stress, and

other factors must then account for 190,000 or 63 percent. Taken together, these 270,000 voles can be considered surplus since relatively few had begun to breed. The 30,000 surviving voles are all potential breeders or non-surplus animals.

A portion of the 30,000 non-surplus breeders move to new habitats, and nearly all become more active as breeding accelerates. Occurring in early spring at a time when there is very little protective cover, this greatly increased movement and activity render the voles highly vulnerable to hawks and owls. During the transition period from winter to spring, raptors generally exert heavy predation pressure and take a minimum of 7,500 voles or 25 percent of the over-wintering population (non-surplus); this too has been observed. There is evidence that from early April until the middle of June they take at least an equal number. (7,500). Perhaps 5,500 or 18 percent of the over-wintering populations (or potential breeders) meet death by all other decimating forces. Nine-thousand-five-hundred are then left, but even then they are not free of raptor predation for raptor pressure is exerted on the voles throughout the year. In a favorable year, the breeding nucleus may restore the original population level of 300,000, but generally the level remains suppressed for three or four years.

The important point is that timing is critical. The percent of mortality inflicted by raptor predation in fall and winter on the surplus voles is low in comparison to the percent ascribed to other decimating forces and perhaps inconsequential; but the reserve is true with regard to the non-surplus animals killed in early spring. Any force that causes great mortality among breeding animals can lower the production of a succeeding generation--raptors prey not only on the surplus but also on the non-surplus breeders and therefore raptors can reduce the reproduction of voles and other over-wintering prey species. (They exert their greatest effort in late winter and early spring)

Can raptor predation exert a controlling effect on plagues of small mammals, particularly rodents? This is a very relevant question since rabies, tuleremia and other diseases transmissible from animals to man may become epizootic when small rodent populations are high.

From the summer of 1957 until the spring of 1958, five counties of eastern Oregon experienced the most severe eruption of meadow voles ever recorded in the state and possibly in North America. Densities of the voles were generally in the hundreds per acre, although local populations may have reached 2,000 to 3,000 per acre in the peak period of November 1957. During the fall and winter of 1957, exceptionally large numbers of hawks, owls, and gulls congregated in response to the unusual abundance of prey. The diet of the collective predatory bird population (gulls included) was almost entirely meadow voles; the total number consumed by thousands of gulls and raptors hunting day and night must have been enormous. (One gull was watched while it consumed eleven voles). Simultaneously, other natural controlling forces were at work on the voles -- disease, lack of food, climatic factors, retarded reproduction, adrenal exhaustion, and perhaps others.

As a result of all decimating factors, including predation, only about ten percent of the vole population survived to April 1, 1958. It is most significant that predation in these Oregon counties was at its highest during early spring and continued high through May and June.

At this time the surviving voles were "non--surplus" animals and this breeding stock was greatly reduced by raptors.

On any given area, raptor predation trends to accelerate when prey populations reach their peak, with migrating raptors moving in to take advantage of unusually large numbers of prey. When peaks reach plague proportions, there is normally a corresponding increase in predation.

It appears that raptor predation is effective in exerting a regulatory effect on prey populations, usually in conjunction with other regulating forces. If we accept this premise, then it becomes apparent that predation by hawks and owls fits into a still broader natural scheme. On a given area of land where we find hawks and owls, we will also find mammalian predators such as coyotes, badgers, bobcats, weasels, skunks, foxes and a host of others. We can think of these as a collective carnivore population. It appears that such a population of carnivores preys on a collective population of prey in much the same way that raptors do. That is the predation is directly related to prey densities and a wide range of prey forms are taken because of the varied adaptations of the predators. This predatory force exerted by the mammal predators dovetails with the raptor predatory pressure in such a way that all elements of the prey population are effected.

As I have indicated earlier, animal populations are regulated by the relations between decimating forces and reproduction. The evolutionary process has produced an extremely delicate and complex balance between the reproductive potential of animal life and the environmental processes that resist it. Reproduction compensates for high or excessive mortality and mortality similary compensates for high reproductive rates. They are functions of one another.

A certain proportion of a prey population is annually doomed. The population ecologist expresses this by saying that the physiological expectation of life exceeds the ecological expectation. Returning to the meadow vole as an example, it means that shielded from the vagaries of the environment and given adequate food and shelter a vole can live for several years. Under natural conditions only an exceptional individual does so; most of the voles born in spring are dead before they have lived a year. In this respect they are "doomed to die before their time". A similar fate awaits the young of passerine birds and many other types of prey.

The important thing that we are concerned with is not that many individuals in a large population are doomed, but how they die -- the manner in which nature contrives by their removal to maintain population levels in harmony with the environment. No single decimating force will play a dominant controlling role at all times. In some situations temperature, snow depth, or moisture impose a high degree of control, and in others food supply, cover, disease, or predation dominate. The failure of one of these basic regulatory forces to operate is normally offset by the functioning of another. The fact that seldom if ever is any single force independent of others makes it difficult to determine the relative importance of each, but we do know that a combination of such forces is necessary to keep animal populations in check. There is also much evidence that the stresses imposed by these factors reduces the reproduction rate. Heavy mortality and lowered reproduction keeps population lowered. Predation is one regulatory force operating conjointly to

bring environmental harmony. I will briefly compare it with some of the other population regulators.

Raptor predation is a highly mobile mortality factor operating around the clock to lower prey increase in proportion to prey density. Hawks and owls strike all components of the collective prey simultaneously and continuously. Other less steadily-functioning forces such as disease, malnutrition, or adverse weather seldom if ever affect the total prey population at the same time but are confined to particular species and limited periods. Disease may strike one prey and food shortage another; weather changes with the days and seasons.

As a suppressive force, predation does not reduce populations to very low numbers, as do epizootics or starvation. Moreover, the number of any single prey species accounted for may be far less than the number killed by a hard winter or a wet spring. However, where raptor predation is dominantly operative, control is characterized by continuous proportionate reduction that tends to keep prey population levels near a mean. Drastic fluctuations in prey numbers are less frequent.

Considering the distinguishing features of raptor predation--its continuous, simultaneous, proportional pressure on all members of the prey community -- it would appear to be a controlling force of particular effectiveness. It also appears to be an extremely complex biological phenomenon.

Other population regulations such as disease and territoriality are equally complex. In contrast, man-made controls of poisoning and trapping are simple and crude by comparison, but they are normally superimposed upon highly sensitive and complex natural control mechanisms. When this occurs the natural control system breaks down. We have then substituted man-made control for natural control. Unfortunately little if any research has been conducted to tell us exactly what happens. Also, unfortunately, once we commit ourselves to artificial control methods and programs, we commit ourselves to doing the task that nature performed but without all of the intricately-meshed checks and balances. In addition, such programs are costly.

Let me describe a documented example of what can happen. During the 1957-58 vole eruption in the Klamath Valley of Oregon, zinc phosphide was used to control the voles in some areas, but in other areas no poisons were used. The zinc phosphide was very effective or, at least so it appeared. Populations of hundreds of voles per acre dropped to only a few per acre by spring. On untreated areas predation, disease (especially tuleremia P tularesis) were important decimating factors. Tuleremia, spread rapidly through the vole population aided by cannabilism which was probably brought about by early stages of adrenal exhaustion. Just as on the poisoned areas, voles dropped to very low densities, but it appeared that higher residual populations remained on untreated than on poison-treated areas. Nevertheless, it was evident that both natural controls and man-instigated controls had caused heavy mortality among the voles. Both nature and man could claim victories and perhaps it required both to contain the plague and reduce economic losses. However, the next fall populations of voles were observed to be considerably higher on some of the treated areas than on the untreated ones. Unfortunately, intensive measurements of the population were not made, so we cannot conclude, but can only hypothesize, that the natural control

mechanisms were more effective than the man-made controls. This, again shows the complexity of population phenomena and the need for research.

What type of research will provide us with the answers we need? There are many approaches, I can suggest only a few as examples and only in very general terms. For example, a long term study of the effects of predation and other population regulating mechanism on a collective prey population is certainly needed. This would require a large undisturbed study area, a team of scientists, computer programming, and continuity of effort over a long period of years. The study should be designed to tell us just how effective natural population regulating mechanisms are and how intricately they are related. This would be a costly undertaking but the scientific rewards would be great.

Another study should be made of a major predator, such as the coyote, to measure and relate coyote predation to some of the important rodent species which constitute its staple food. This study would also require a large undistrubed study area, a period of years, a team approach and ample funding. On part of the area, an undisturbed situation between coyotes and their prey could be studied while on another part of the area coyote and rodent populations could be manipulated and controlled and the effect of this control evaluated in terms of whether it presents or alleviates depredations by coyotes on sheep and also provides more forage by keeping rodent numbers depressed. The study should be designed to tell us what happens ecologically when we control coyotes and then we control their prey. Do we improve on nature? Do we create greater fluctuations in number of predators and prey? Is there improved range conditions following control and if so, how much improvement. With rodents reduced in numbers, do the coyotes turn to other prey, or do they emigrate, or do they die? What is the cost-benefit ratio and is there a real economic gain?

This and other research could provide the basic information we need to scientifically evaluate a wide range of control programs. In addition to basic research, we should renovate the already existing animal control programs. The personnel should be professional people, able to gather quantitative data and to evaluate these in terms of the biological and economic objectives of the program. The programs should be relatively small and tailored to specific situations. They should be designed as much for data gathering as for control. All the biological evidence to date indicates that widespread, massive killing is seldom if ever justified. The history of control programs also suggest that the old views and prejudices must go. We must think in terms of synecology and ecosystems.

Over-populations of rodents, flocking birds, and other species attaining pest proportions in predator-controlled areas have frequently caused extensive damage to native vegetation, soil, crops, livestock, and other property, or they have become public health problems. There are thousands of documented cases where entire crops have been consumed by over-populations of rodents, where rangelands have been nearly denuded of protective vegetation and severe erosion has followed. The economic loss in crops and forage from rodents alone runs into millions of dollars annually, (each day a vole consumes its body weight (30 grams) in succulent greens and tubers). No knowledgeable scientiest or citizen would deny this. However, elimination of predators has undoubtedly contributed to such situations, yet today there still are many areas where the killing of predators has almost completely eliminated the beneficial controlling effect of predator populations on rodent populations.

To destroy individual predators or perhaps even to reduce the numbers of a particular species is not at all the same thing as destruction of an entire predator population. When a prey species such as a game bird happens to be valuable to man and has been too heavily harvested, of if the prey animal is subject to especially heavy environmental resistance or where artifically-formed prey populations are not secure in an unprotective environment, then predation is likely to become the factor limiting increase. In such instances, predation can have a critical effect tending to exterminate rather than regulate and temporary predator control seems advisable.

Similarly, where rodents have attained high population levels in areas of intensive land use and where the natural predators have been greatly reduced or eliminated, then some man-made control may be necessary. But how much, and for how long? Until research provides us with more answers, it would appear that both predator and rodent control measures should be finely-calculated emergency operations, used only until more basic remedies can be applied. Even such emergency operations should be moderate, and when possible should be attained by re-establishing a natural predator-prey balance. Man, by concerted action and persistent effort, can and has reduced predator populations to critically low levels over wide areas, unaware or disrespectful of the fact that the checks and balances inherent in the natural relations between predators and prey are the result of an infinite number of causes and effects that have evolved as animal life evolved. Nature's system may not be perfect as it relates to man, but it operates impersonally and timelessly, and as yet appears to be far superior to any widespread control by humans.

We must keep in mind that although we have greatly altered our environment and will continue to do so, our changes do not radically deflect or eliminate fundamental natural laws and processes. This being true, we should try to utilize the force of predation and other natural population regulators. We should allow them to operate over the vast regions where we ourselves have little control and curb them locally only when there are strong reasons for doing so. We should record and measure the effects whenever possible.

We would do well to remember Lord Kelvin's advice to scientists. He said, "When you can measure what you are speaking about and express it in numbers, you know something about it, and when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind." This noted English scientist was referring primarily to the physical sciences, but his statement is equally true of the biological sciences. Knowledge of the role of predators in nature, of the intricate relationships that derive from killing other creatures in order to live, is still "meager and unsatisfactory".

Our knowledge of how to devise population controls to effect an economic or possibly an ecologic gain or curb a disease such as rabies in order to protect humans is also "meager and unsatisfactory". We need to do a lot more measuring, and this means a lot more research. Control programs deal with extremely complex biological situations. Perhaps one of the best things we could do is to turn our control programs with all of their fundings into research programs until we know a lot more about what we are doing.

DOCUMENT #11

DEPARTMENT OF AGRICULTURE'S

RODENT AND RABID SKUNK ADVISORY COMMITTEE

MINUTES ON THE MEETING DECEMBER 19, 1972.

MEMBERS PRESENT: Dr. Fritz Bell
Bill Cheney
Dr. Robert Eng
Gary Gingery
Bill Hicks
Ole M. Ueland - Representing Pete Jackson
Ken Quickenden - Representing Vern Sloulin
Kit Walther - " " "

MEMBERS ABSENT: Tom Mussell

GUESTS: Bob LaRue
Norton Miner
Ken Seyler

SPECIAL GUESTS: Dr. Glenn Halver

The meeting was opened by the reading of a preliminary resolution on rabies and its control for consideration by the committee. The following is a text of the resolution:

A joint resolution of the Senate and House of Representatives respectfully requesting the Congress and the President of these United States to establish a national research program to protect the citizens of Montana and other states from rabid wild animals.

Whereas, the state of Montana has experienced wildlife rabies for several years and expects to continue experiencing wildlife rabies in the future.

Whereas, the exposure of Montana citizens directly to wildlife rabies has subject these individuals to the traumatic experience of fear for life and the anguish of experiencing anti-rabies innoculations.

Whereas, communities experiencing wildlife rabies and indirect exposures may experience severe consternation thereby resulting in emotional demands to state and local governments for control measures whether or not they were successful in the past.

Whereas, wildlife rabies may also effect domestic livestock and could result in an economic loss to the rancher.

Whereas, Montana has carried out selective animal control programs to suppress skunk populations experiencing rabies in the past, the results of these actions are subject to many varying opinions and interruptions as to their success.

Whereas, the Department of Agriculture Advisory Council on Rodents and Rabid Skunks having made a comprehensive review of rabies in wildlife find that the following areas must be researched in order to obtain all the information necessary to protect man and livestock from rabies:

1. The epidemiology of rabies must be further researched
2. The ecology of various vector species having a high incidence of rabies must be researched
3. Evaluation of control measures must be researched to determine their true significance and success
4. Finally, the council recommended that all these studies should be initiated and coordinated by the Federal Government to providing standardized rabies control practices among the states.

Now, Therefore, be it resolved by the Senate and House of Representatives of the state of Montana:

That Montana respectfully requests the Congress and President of the United States to provide the necessary manpower and funds to implement a national research effort on rabies and its control in wildlife.

Be it Further Resolved, that Montana is interested in obtaining control programs, which do not effect our environment, but provide the methods to prevent rabies in man and livestock.

Be it Further Resolved, that a copy of this resolution be sent by the Secretary of the State of Montana to the Congress through Montana's appropriate delegates and to the President of the United States.

Be it Further Resolved, that a copy of this resolution be sent to the Governor for his review and use in assisting the citizens of Montana in the prevention of rabies in wildlife.

Bill Hicks asked if the resolution was a result of Dr. Winkler's presentation earlier in the year. Gary Gingery commented that it was. Dr. Bell stated that wildlife rabies on the national level and in some states is a responsibility of many agencies and no one agency is directly responsible for the overall program considerations. Dr. Bell felt that a resolution of this type is certainly acceptable and should be passed by the committee after it is revised. Bill Cheney requested that the reference to emotional concerns by communities be eliminated. It was decided by the committee the chairman should redraft the resolution and forward it to each member prior to the next meeting.

Dr. Halver reported on the preliminary action taken by the Livestock Board concerning rabid skunks and their control in Montana. Dr. Halver stated the following:

A policy change is in the making on rabid skunk control within the Department of Livestock. Consideration is being given to abandonment of fixed perimeters and the utilization of toxic baits within the fixed area. This portion of the program is based upon Ken Seylers studies on rabid skunks in 1972. In other words, only trapping, shooting and denning will be utilized. The Livestock Board also believes that in areas with concentrated human populations and relative high skunk populations, the state must be prepared to handle rabies cases on an emergency basis. The state veterinarian with his current power may invoke emergency provisions which will probably allow the use of toxicants if necessary. (It should be noted here that the State Health Officer also has the power to declare an emergency when public health is in jeopardy.) Bill Cheney stated that the intent of the Livestock Board is as explained by Dr. Halver.

Norton Miner stated that trapping and shooting could be utilized as an evaluation program prior to the use of toxicants. Bill Cheney commented that his division will attempt to obtain an agreement with the Bureau of Sports Fisheries and Wildlife to carry out any necessary rabid skunk control programs. It should be noted that the Bureau is not allowed to use toxicants unless an emergency is declared.

Dr. Halver felt that a flexible program of the type being proposed is proper because of variable local needs and skunk habitats. Bill Cheney indicated that when the State Veterinarian declared an emergency, he would usually contact the Departments of Health and Fish and Game for advise. Dr. Halver pointed out that Montana had probably experienced only one extreme emergency situation in the town of Plevena.

Ken Quickenden asked if guidelines should be established if the committee so desired. Dr. Bell commented that in the presence of a high population of rabid animals in close proximity to human or livestock populations that the Fish and Game Department should always be involved when there is a potential for a declaration of an emergency.

Bill Cheney then commented that the Fish and Game Department may be sponsoring a new Non-Game Species Act which may give them some jurisdiction over skunks. The committee decided that it would wait for the final draft of the Livestock Board policy on rabid skunk control prior to making a final recommendation. It is the committee's understanding that the final draft of this policy will most likely be completed by January 9.

Dr. Fritz Bell gave a short report to the committee on his meeting held in LeHon, France. Dr. Bell is a member of the International Permanent Committee on rabies vaccines.

The committee then reviewed the rodent survey information obtained from most of Montana's counties. After discussing the potential uses of the survey form the committee began reviewing the preliminary recommendations on rodent control in Montana. The committee reviewed these preliminary recommendations page by page and made a number of changes. The preliminary recommendations will be revised and submitted to the committee for their final consideration at the next meeting.

One of the major provisions of the preliminary recommendations involved the establishment of an evaluation program. Bill Cheney and Ken Seyler presented information on the Livestock Board's actions on establishing an evaluation program in Montana. Enclosed is a draft on the Livestock Board's recommendations for an evaluation system. The committee's preliminary evaluation program and the Livestock Board's are quite similar. The two will be incorporated together and revised for final evaluation by the committee at the next meeting.

The chairman was requested to prepare the resolutions concerning rabies research, predator control research funds, the preliminary recommendations for a rodent program and a legislative draft for the enactment of an evaluation program on rodents, rabid skunks and predators in Montana.

The meeting adjourned.

DOCUMENT #12

DEPARTMENT OF AGRICULTURE

Advisory Council on Rodent and Rabid Skunk Control

Minutes of the Meeting

January 9, 1973

MEMBERS PRESENT:	Dr. Fritz Bell
	Bill Cheney
	Kit Walther (representing Vernon Sloulin)
	Tom Mussehl
	Dr. Robert Eng
	Gary Gingery
MEMBERS ABSENT:	Bill Hicks
	Peter Jackson
GUESTS:	Ken Quickenden
	Bob LaRue
	Ken Seyler
	John Hechtel
	Terrill & Tina Deatsch
SPECIAL GUEST:	Dr. John Safford, Administrator and State Veterinarian Animal Health Division Department of Livestock

The Chairman, Gary Gingery, opened the meeting at 9 o'clock. The first half hour of meeting was spent in outlining the items that needed to be completed in order that they could be presented to the 1973 Legislature and to the Governor.

Dr. John Safford discussed the Department of Livestocks recently revised policy on rabid skunk control in Montana. This policy was adopted by the Montana Livestock Board on December 12, 1972. This policy is set forth below.

"Mr. Ted Saylor made a motion that the Department of Livestock abandon a predetermined skunk reduction program of a fixed area perimeter and using toxicants. The skunk reduction program shall be accomplished by trapping and shooting in an area where merimeters shall be determined in relation to the location of a rabid skunk by the Departments Biologist. In the event that this program does not move adequate to protect animals and man from undue exposure to rabies then upon the determination of the State Veterinarian that a rabies emergency does exist, toxicants will be employed to effectuate the skunk reduction program in the area selected by the Biologist. The motion was seconded by Mr. Simons and carried unanimously".

Following Dr. Saffords general discussion of rabies, rabid skunks and the resolution the council members asked Dr. Safford the following questions:

Tom Mussehl - Who is the Department's Biologist?

Dr. Safford - Ken Seyler

Dr. Bell - The resolution states that trapping and shooting shall be accomplished! Is it always necessary to carry out control programs?

Dr. Safford - No!

Tom Mussehl - How many personnel will assist Ken Seyler?

Dr. Safford - 3 or 4 more individuals usually involved!

John Hechtel - What are the powers of state veterinarians relative to rabid skunk control?

Dr. Safford - When a laboratory positive rabid skunk is found, the Department of Livestock always attempts to define the problem prior to taking any action. Items, such as, the skunk population in the area of concern is determined, have humans or livestock been bitten or exposed to the skunk(s), habitat and other pertinent characteristics are determined. If livestock have been bitten or exposed I can declare an emergency. In conjunction with my actions, Dr. John Anderson of the Department of Health may declare an emergency if the public health of the citizens in area is affected.

Tom Mussehl - Who is responsible for the toxicants?

Dr. Safford - Department of Livestock is responsible and must follow the pesticide laws and rules of the Montana Department of Agriculture and EPA.

The advisory council endorsed the Livestock Boards policy. The council also recommended that the state of Montana should go on record for supporting a national research program for wildlife rabies.

Dr. Safford then requested a change in the rabies resolution developed by the council. Dr. Safford asked that the first Whereas be changed to "in recent years" from "for many years"!

Tom Mussehl - requested that the news release on predators and rodents be placed in the minutes of meeting. Following is the news release carried by various state newspapers.

NEWS RELEASE

Helena (AP) STATE PLANNING RODENT CONTROL - State government agencies are in the midst of mapping widespread plans for predator and rodent control programs to be conducted across the state next year.

William G. Cheney, administrator of the Brands-Enforcement Division

of the Department of Livestock said Monday the State Board of Livestock will consider predator control measures at its meeting next week in Billings. The sessions, to be held during the Wool Growers Convention, will consider a recent presidential directive banning the use of toxic poisons to kill predators on federal lands.

"We will have to consider the use of airplanes, traps and guns for control measures", he said. Cheney said coyotes would be the main target of predator control efforts.

Gary Gingery, administrator of the Pesticide Control Division of the Department of Agriculture, said a massive rodent control program is being planned for next spring with livestock, health and fish and game officials.

He said the Governor's Advisory Council on Rodent and Rabid Skunk Control would be considering the program at a Helena meeting later this month.

"We want to control rodents, not necessarily eradicate them", Gingery said. He said the Council will consider setting up a control program using poisons and traps with evaluation efforts made before and after the controls are instituted.

He said different areas of the state have different problems with rodents. In northeast Montana, Norway rats have been eating grain stocks, while prairie dogs have been eating crops in the field in Flathead County, he said. Elsewhere pocket gophers have been causing problems by not only eating grain, but by tunnelling activities.

Gingery said gopher tunnels have diverted water from some farm irrigation systems to prevent flows to the end of fields.

He said the mounds built around rodent homes also cause damage to farm machinery.

He said it may be necessary to go to the Legislature for an appropriation for the program but that firm details will not be known until after the Council meets.

Cheney said that a series of back-country roadblocks aimed at thwarting

cattle rustling have been more effective in curbing illegal hunting activities. He said illegal takes of game are turning up more frequently than evidence of rustling at roadblocks, especially in southeastern Montana.

Mr. Mussehl objected to the statement - that a massive rodent control program is being planned by the representative of the council. Bill Cheney and Gary Gingery both stated that they did not say that a massive program was being developed, only that a program involving control and evaluations were actually being developed by the committee.

The Council spent the remainder of the meeting completing the final draft of its interim report which was approved by the members at the end of the meeting.

Meeting adjourned.

DOCUMENT #13

RESULTS OF A RODENT SURVEY

Submitted to Montana's Counties

By the

Department of Agriculture's Advisory Council

on Rodents and Rabid Skunk Control

December 1972

RESULTS OF A RODENT SURVEY

Submitted to Montana's Counties

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December 1972

PURPOSE OF THE COUNCIL AND MEMBERSHIP

The purpose of the advisory council is "to develop a program for the control of rodents and rabid skunks in Montana, with appropriate legislation, if necessary, to be presented to the governor and 1973 legislature".

The objectives for the committee include: 1.) establishment of rodenticide bait mixing plant, 2.) establishment of procedures for controlling the sale and use of such products, 3.) determining if alternatives for non-chemical control of rodents are available, 4.) and development of an organized program for controlling rodents affecting food supplies and the health of our citizens while insuring that our environment is protected from any possible adverse effects of pesticides.

COMMITTEE MEMBERS

Dr. J. Frederick Bell, Medical Director
Rocky Mountain Laboratory, Hamilton

Wm. G. Cheney, Administrator
Brands-Enforcement Division, Department of Livestock, Helena

Dr. Robert L. Eng, Professor of Zoology
Department of Zoology & Entomology, MSU, Bozeman

Gary L. Gingery, (Chairman) Administrator
Pesticides Control Division, Department of Agriculture, Helena

William Hicks - Rancher, Wolf Creek

Peter V. Jackson, Agriculturalist & Range Management Specialist
Department of Natural Resources, Helena

Tom Mussehl, Chief of Research Section
Department of Fish and Game, Bozeman

Vernon Sloulin, Bureau Chief, Environment Services
Department of Health and Environmental Sciences, Helena

The committee would like to thank the following individuals who assisted in the preparation of this report.

Ken Seyler, Environmentalist
Division of Brands Enforcement
Department of Livestock

Robert LaRue, Inspector
Division of Pesticides Control
Department of Agriculture

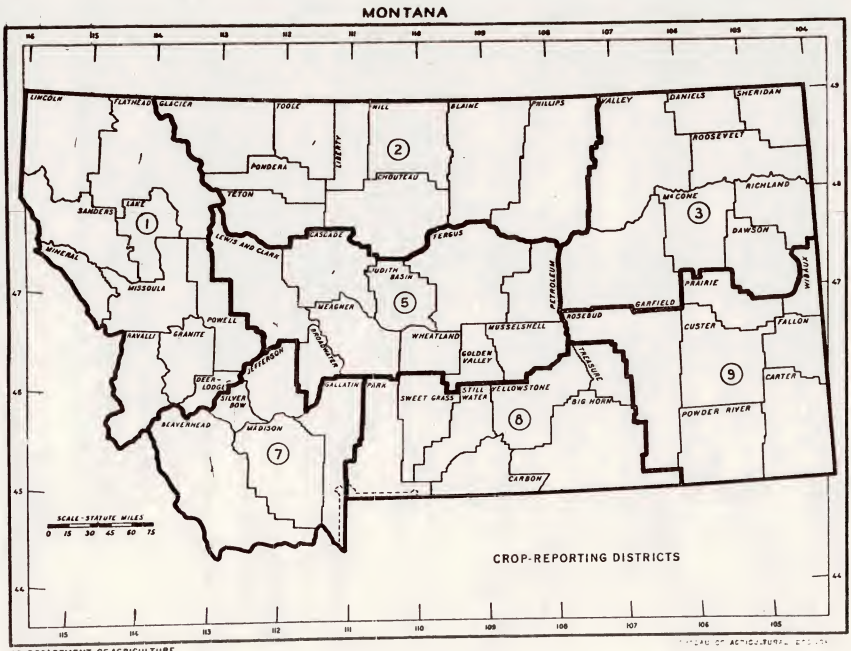
The Montana Cooperative Extension Service and
the county agents and their committees who made this
report possible for use and evaluation by the Advisory Council

The advisory council having obtained information on rodents and their control from other states and from various knowledgeable speakers, decided that additional information should be obtained from each county in the state. A survey form was developed by the council, and with the cooperation of the Montana Extension Services, the form was submitted to those counties served by a county agent. There are 53 counties presently served by county agents in Montana. The counties not served are Meagher, Petroleum and Wheatland.

The survey information obtained from the counties provides only an indication of each counties rodent problems. This information should only be interpreted and utilized as an expression of local problems and anticipated needs and may or may not represent actual situations being experienced in each county. The council believes that the county agents and their committee members completing the form would not want the information accepted as findings of fact, but only as an indication of their problems and needs.

The information and data in this report is presented on a county and an agricultural reporting district basis. A map illustrating the counties in each district may be found on page 3. Agricultural reporting districts illustrate to a degree the types of agricultural operations and the general environmental made up of each district and its counties.

While this information is presented on the basis of counties and districts, it must be realized that rodent problems are not experienced throughout these areas. Rodent problems are usually specific to limited areas thus programs must reflect special local problems and not county estimates of problems.



U.S. DEPARTMENT OF AGRICULTURE

QUESTION NO. 1

Indicate by marking the appropriate box with a check (x) the common rodents in your county. In the second column indicate degree of economic importance by numbering 1 through 5, 1 being of most importance. More than one species may be rated number 1. If a species is unimportant write (0) in the second column. In the third column indicate the relative abundance of each species in 1972. H - high
M - moderate
L - low

SPECIES	PRESENT IN COUNTY	ECONOMIC IMPORTANCE	1972 POPULATION
Prairie Dog			
Richardson Ground Squirrel			
Columbia Ground Squirrel			
Pocket Gopher			
Microtus (field mouse)			
Other (specify)			

The answers to this question establishes if the rodents listed are present in the county and the local committees evaluation of their economic importance and population level. These evaluations are relative values and must be interpreted accordingly. However, they may provide the means to establish a system of critical evaluation in the future.

The averages presented for districts and the state are also relative values which only express an idea as to the types of programs that could be implemented per county or district. The state averages help to illustrate general overall rodent problems and possible priorities.

The maps on the following pages 9, 10, 11,12 and 13 illustrate visually the estimated economic levels and population levels of the five rodent species of concern in this survey. It should be pointed out that the five (5) species maps, pages 9 to 13, only indicate those counties experiencing economic damages. A number of counties indicated that the species were present in their county but have little economic importance.

ESTIMATED ECONOMIC IMPORTANCE AND POPULATION LEVELS FOR VARIOUS RODENT SPECIES BY COUNTY AND AGRICULTURAL REPORTING DISTRICT

DISTRICT 1	PRAIRIE DOG	RICHARDSON GROUND SQUIRREL	COLUMBIA GROUND SQUIRREL	POCKET GOPHER	MICROTUS
DEER LODGE	--	1-H	1-H	4-L	4-L
FLATHEAD	--	--	1-M	2-M	5-L
GRANITE	3	1-H	1-H	2-H	-H
LAKE	--	--	2-M	2-M	1-M
LINCOLN	--	--	1-H	1-H	4-L
MINERAL	--	--	2-M	1-M	3-L
MISSOULA	--	--	2-H	1-H	4-?
POWELL	--	1-H	1-H	3-M	4-M
RAVALLI	--	--	2.5-H	1-H	2.5-L
SANDERS	--	2-M+	1.H	1-H	1-H
AVERAGE FOR DISTRICT	3	1.25	1.45	1.80	3.17
TOTAL COUNTIES REPORTING SPECIES	1	4	10	10	10
DISTRICT 2					
BLAINE	3-H	1-H	--	4-L	5-L
CHOUTEAU	3-M	1-H	-L	2-H	3-M
GLACIER	--	1-H	5-L	3-M	5-M+
HILL	-L	1-H	--	3-M	2-H
LIBERTY	5-L	1-H	--	4-M	5-?
PHILLIPS	4-L	3-M	--	-L	2-M
PONDERA	--	--	--	--	--
TETON	-L	3-H	-L	-L	-M
TOOLE	4-L	1-H	--	2-M	1-H
AVERAGE FOR DISTRICT	3.80	1.50	5	3	3.29
TOTAL COUNTIES REPORTING SPECIES	7	8	3	8	8

DISTRICT 3	PRAIRIE DOG	RICHARDSON GROUND SQUIRREL	COLUMBIA GROUND SQUIRREL	POCKET GOPHER	MICROTUS
DANIELS	--	1-H	--	5-L	4-M
DAWSON	--	--	--	--	--
GARFIELD	3-M	--	--	5-L	5-L
MC CONE	1-M	--	--	1-M	5-L
RICHLAND	-L	1-H	--	1-H	3-M
ROOSEVELT	5-L	1-H	--	5-L	3-H
SHERIDAN	--	3-M	--	--	--
VALLEY	5-H	1-H	--	3-H	4-M
AVERAGE FOR DISTRICT	3.75	1.40	--	3.33	4.00
TOTAL COUNTIES REPORTING SPECIES	5	5	--	6	6
DISTRICT 5					
BROADWATER	5-L	1-H	5-L	5-L	3-M
CASCADE	4-L	2-M	--	2-H	3-M
FERGUS	--	--	--	--	--
GOLDEN VALLEY	4-M	1-H	--	1-H	4-M
JUDITH BASIN	5-L	--	1-H	2-H	3-M
LEWIS & CLARK	5-L	2-H	1-H	3-M	4-L
MEAGHER	--	--	--	--	--
MUSSELSHELL	4-M	1-H	--	1-H	4-M
PETROLEUM	--	--	--	--	--
WHEATLAND	--	--	--	--	--
AVERAGE FOR DISTRICT	4.50	1.40	1.00	2.33	3.50
TOTAL COUNTIES REPORTING SPECIES	6	5	3	6	6

DISTRICT 7	PRAIRIE DOG	RICHARDSON GROUND SQUIRREL	COLUMBIA GROUND SQUIRREL	POCKET GOPHER	MICROTUS
BEAVERHEAD	--	3-M+	3-M+	3-M+	1-M
GALLATIN	--	--	--	--	--
JEFFERSON	5-L	2-L	2-H	1-H	5-M
MADISON	--	2-L	2-H	1-H	5-M
SILVER BOW	--	4-M	1-H	2-H	5-L
AVERAGE FOR DISTRICT	5.00	2.75	2.00	1.75	4.0
TOTAL COUNTIES REPORTING SPECIES	1	4	4	4	4
DISTRICT 8					
BIG HORN	3-M	-L	--	2-M	4-M
CARBON	4-M	5-L	--	3.5-M	4-M
PARK	5-L	1-H	3-H	2.5-H	2-H
STILLWATER	3-M	1-H	--	2-H	1-H
SWEET GRASS	1-H	1-H	5-L	3-M	4-M
TREASURE	1-H	--	--	1-H	--
YELLOWSTONE	--	--	--	--	--
AVERAGE FOR DISTRICT	2.83	2.0	4.0	2.33	3.0
TOTAL COUNTIES REPORTING SPECIES	6	5	2	6	6
DISTRICT 9					
CARTER	5-L	--	--	4-L	5-L
CUSTER	5-H	3-L	--	5-H	5-H
FALLON	5-L	--	--	4-L	5-L
POWDER RIVER	5-H	--	--	2-L	--
PRAIRIE	3-H	--	--	3-H	5-M
ROSEBUD	1-H	--	--	1-H	4-M
WIBAUX	--	--	--	--	--
AVERAGE FOR DISTRICT	4.0	3.0	0	3.17	4.8
TOTAL COUNTIES REPORTING SPECIES	6	1	0	6	5

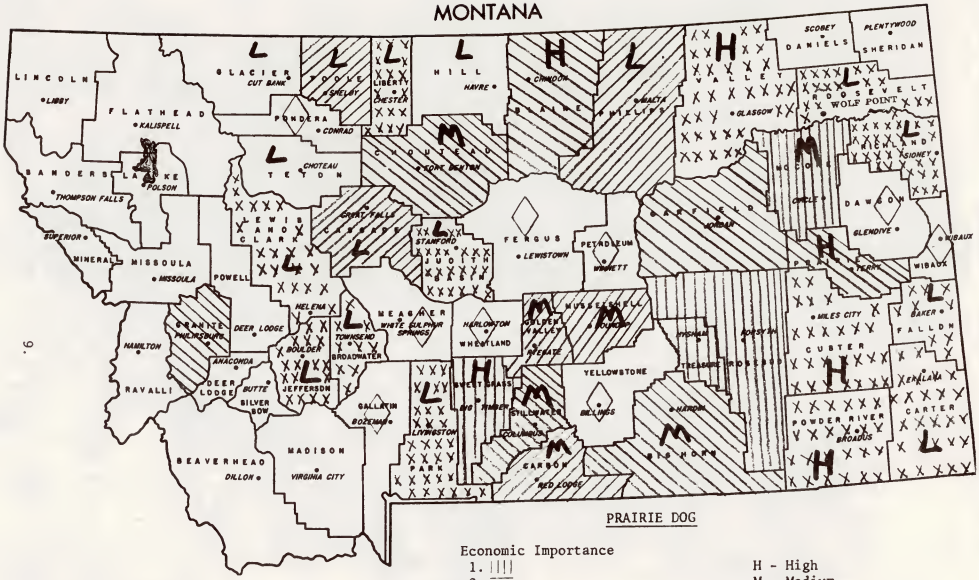
AVERAGE ESTIMATED ECONOMIC IMPORTANCE PER SPECIES BY
AGRICULTURAL REPORTING DISTRICT

AGRICULTURAL DISTRICT		PRAIRIE DOG	RICHARDSON GROUND SQUIRREL	COLUMBIAN GROUND SQUIRREL	POCKET GOPHER	MICROTUS
NORTHWEST	1	3.00	1.25	1.45	1.80	3.17
NORTH CENTRAL	2	3.80	1.50	5.00	3.00	3.29
NORTHEAST	3	3.75	1.40	0	3.33	4.00
CENTRAL	5	4.50	1.40	1.00	2.33	3.50
SOUTHWEST	7	5.00	2.75	2.00	1.75	4.00
SOUTH CENTRAL	8	2.83	2.00	4.00	2.33	3.00
SOUTHEAST	9	4.00	3.00	0	3.17	4.80

NUMBER OF COUNTIES REPORTING SPECIES AND THE AVERAGE
ECONOMIC IMPORTANCE PER SPECIES FOR THE
COUNTIES REPORTING

(45-Counties Reporting of 56)

RODENT SPECIES	COUNTIES REPORTING SPECIES	AVERAGE ECONOMIC IMPORTANCE
PRAIRIE DOG	29	3.79
R. GROUND SQUIRREL	31	1.71
C. GROUND SQUIRREL	19	1.97
POCKET GOPHER	44	2.50
MICE	42	3.61



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STATE PUBLISHING COMPANY
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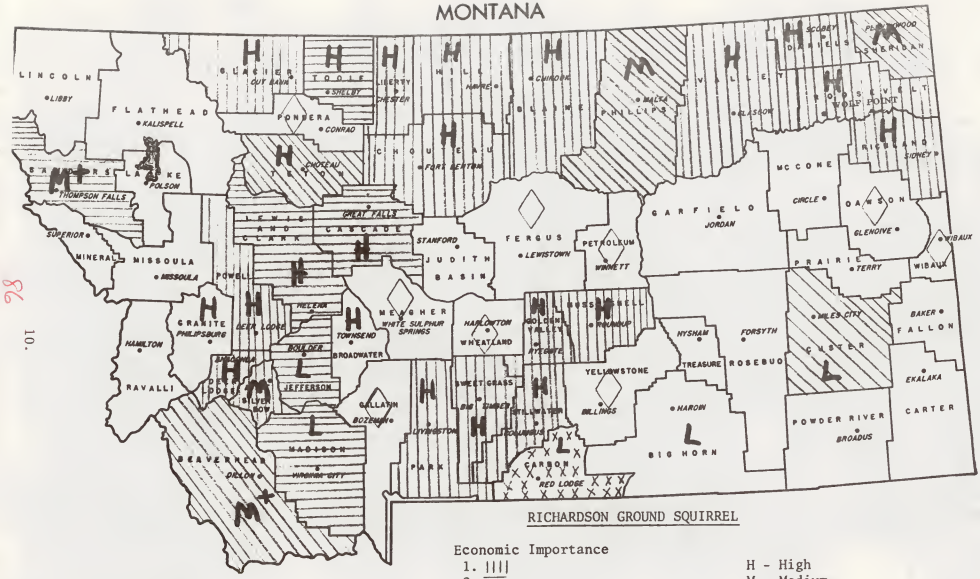

RICHARDSON GROUND SQUIRREL

Economic Importance

1. ||||
2. ≡
3. ///
4. ////
5. XXX XXX

H - High
M - Medium
L - Low
◇ - Counties Not Reporting

No. 1052 — County Outline Map
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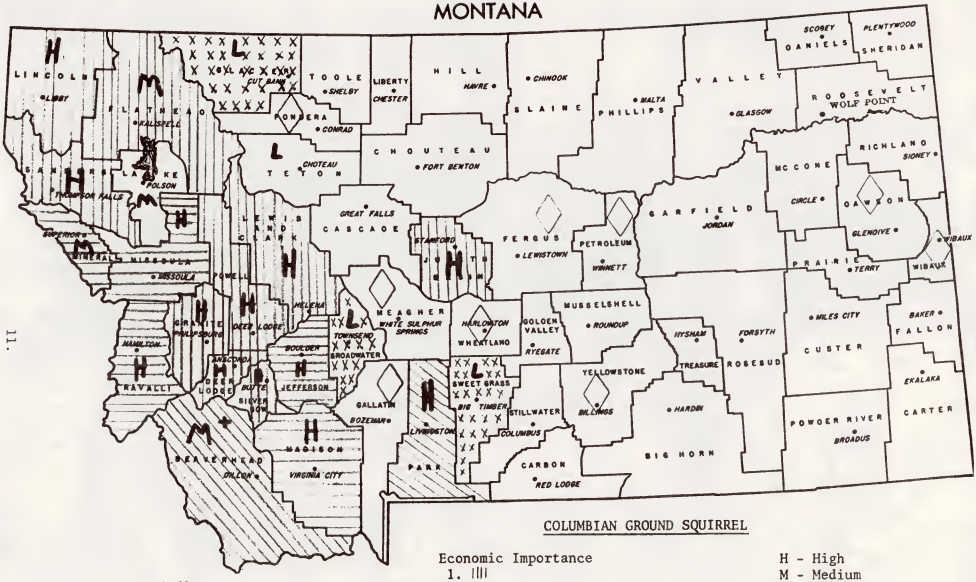
10.

MONTANA



COLUMBIAN GROUND SQUIRREL

Economic Importance

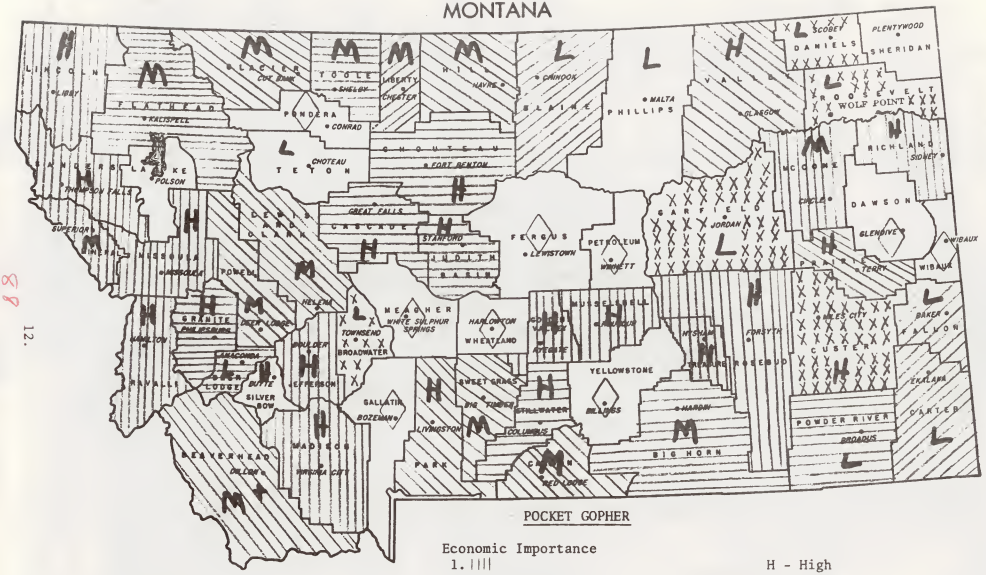
1. ||||
2. ≡
3. ▨
4. ////
5. ×××

H - High
M - Medium
L - Low

◇ - Counties not Reporting

No. 1052 — County Outline Map
STATE PUBLISHING COMPANY
Helena

MONTANA



POCKET GOPHER

Economic Importance

1. ||||
2. ≡
3. \\\
4. ///
5. x x x / x i x

H - High
M - Medium
L - Low

◇ - Counties Not Reporting

No. 1052 — County Outline Map
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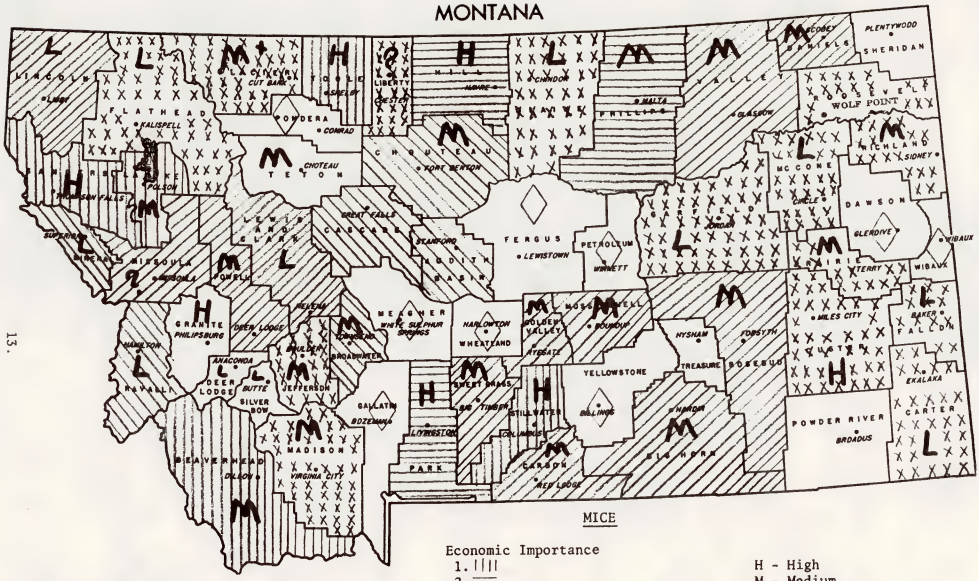
12.



MICE

Economic Importance

1. ||||
2. ≡
3. \\\
4. ///
5. xxx xxx

H - High
M - Medium
L - Low

◇ - Counties Not Reporting

No. 1052 — County Outline Map
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13.

Questions #2 and #11

#2.) Describe on a separate sheet the type of damage, approximate acreage and special problems unique to your county per the (5) species. Consider the following factors: grain crops, alfalfa and hay crops, pasture lands, grass range lands, irrigation, forest, recreational areas, damages by machinery and any special urban problems. A color coded map indicating the distribution of the rodents may be prepared if your committee so desires.

#11.) What would be your recommendations for the establishment of a long range rodent control program in Montana?

_____

_____

_____

_____

_____

These questions need very little explanation, except to say that the districts could be more specific in outlining their problems (question #2) and in establishing local recommendations (question #11) in comparison to Question #1. This information is presented on the basis of agricultural reporting districts and their respective counties. Some of the counties prepared detailed maps of their problem areas; however, it was not feasible to include them in this report. The maps will be utilized by the committee and others in evaluating the states rodent problems.

DISTRICT 1

Deer Lodge County

Flathead County

Granite County

Lake County*

Lincoln County

Mineral County*

Missoula County

Powell County

Ravalli County*

Sanders County

* District counties not reporting or answering questions #2 and #11.

Rodent Questionaire for Deer Lodge County

Question #2:

Over entire acreages of Deer Lodge County, rodent damage is quite excessive on grain crops, native grass meadows, alfalfa meadows, tame pasturelands, grass rangelands, and irrigation systems. Rodents are reported not to be doing excessive damage in the forest lands, or have caused any particular problems in recreation areas. In Deer Lodge County, the Columbia Ground Squirrel is the most prevalent, with the Richardson Ground Squirrel prevalent in low valley areas.

Question #11:

To have strychnine rodenticide available for use at the proper time of year and in sufficient strength. Also, to have available a supervised 1080 program which could be implemented when rodent populations have reached a certain point. If there are any other non-chemical controls, then educational programs should be instituted to inform farmers and ranchers and others concerned with rodent control.

2. Field mice and skunks are pretty uniformly distributed over Flathead County. They do not, however, constitute much of an economic problem. Occasionally there is some girdling of trees or a few baby chicks get killed but these are problems the individual farmer can normally handle.

I'd also like to use this space to talk about our number one problem, the Columbia Ground Squirrel, since it is of most economic importance.

Flathead County's problem with the Columbia Ground Squirrel is almost unique in the state because our high value land is situated in a little valley above Flathead Lake. During the summer after the forest lands and other marginal areas have been seared by the sun it is the practice of the ground squirrels to move out into the valley floor. The migration continues then into the center of the valley until, as in 1947, the whole area becomes infested.

Since 1947 with the exception of the past two seasons and possibly a period between 1963 and 1967 we have had available the services of federally supervised control programs. 1080 treated grains supplemented with farmer applied strychnine treated grain were sufficient to hold the rodents back on the forested and marginal lands. During this 25 year interim period the population in the upper Flathead Valley has grown to around 40,000 people making such control techniques as shooting both hazardous and impractical.

If control methods are ineffective or suitable poisons become unavailable, serious damage to Flathead County's agricultural productive capacity will surely result. The 1947 County Agent annual report lists a campaign that began on May 12, extending through July 15, and covering 342,600 acres of badly infested lands. A further notation indicated that 80,000 acres that had not been covered in 1947 would be treated in 1948. This would appear to confirm that the entire valley was infested.

During the last of the 1960's a well supervised crew utilizing a minimum amount of poison, affecting no non-target species proved that this problem can be solved to nearly everyones satisfaction with the judicious use of 1080. Hysteria stopped us.

Question No. 11

Administered by some unit of state government.

Implemented along the same pattern used by Division of Wildlife Services.

Funded by landowners affected. Restricted to those areas of high value cropland or a source of infestation for high value cropland. This is essentially a containment problem not an elimination program.

Monitoring and survey follow up to ensure responsible control work without inordinate damage to non-target species or the environment.

2. The primary damage in Granite County is to irrigation dikes and ditches. Hay lands and pasture lands are also bothered but the amount of economic loss to pastures and hay lands is very hard to have a dollar figure placed on. Also, there would definitely be an economic loss to equipment. We have, at this time, no way of knowing what these dollar figures would be. If further information was needed we could possibly contact ranchers and ditch-riders individually and ask them for an approximate dollar amount, but this would take considerable time.

Question No. 11:

Individual counties should set up their own programs to fit their particular needs and desires. The county should support this financially with possibly a small subsistence from the state and also the rancher or farmer should be expected to bare some of the cost. The rodent control program could possibly be handled much in the same way in which county weed boards work.

2. Columbia Ground Squirrel - Eats and packs down grass in the infested area so that cattle grazing is reduced by 50% or more in some cases. Holes also cause a dangerous situation when riding horses through these areas. Found in nearly all valley areas of the county. Extent of infestations seem to vary. There are an estimated 9,400 acres of infested acres of private land in the county.

   Pocket gopher - cause loss of production and greatly increases machinery costs. It is estimated that 60% of the hay and cropland and 50% of the tame pasture land are infested to varying extents by these animals.

   There is also a large population of both ground squirrel and pocket gophers on State, Federal, and "company owned" land. Many ranchers feel these populations pose a great threat to them as potential sources of reinfestation. There are 1,750,950 acres of federal land compared to 66,000 acres private range and crop land in Lincoln County.

   Actual numbers and damages have never been studied closely to my knowledge. Setting up a research area would be advisable and, I think feasible on the state level.

   Field mice - there is no general infestation problem with field mice, however some ranchers have suffered damages to grain and hay.

   Moles - there is an increasing amount of damage to gardens and lawns caused by moles (very hard to estimate loss).

Question No. 11:

   Yes - will have to be continuous.

   Hard to get all due to federal, state and county land.

GOPHER PROBLEM IN MISSOULA COUNTY

The Columbia Ground Squirrel and the pocket gopher are the main rodents that seem to be of economic significance in Missoula County. There is a substantial population of field mice but they do not seem to create the problem that the above two listed do.

With strychnine grain not being available to the ranchers this past spring, several got together to sponsor a proposal through the Bitter Root RC&D. Working through this group and the USDA Committee for Rural Development and in checking with other people and groups they have tried to come up with information which I have included in this report.

The agriculture trends in Missoula County have been from sugar beets and grain production to livestock and forage production. There has been a trend from flood irrigation to sprinkler irrigation. At the present there are about 12,000 acres of sprinkler irrigation in Missoula County and of this about 8,500 acres do have significant gopher populations, particularly pocket gophers. Sprinkler irrigation seems to create a habitat which allows them to reproduce and multiply whereas flood irrigation tended to flood them out. There are non-irrigated lands in the county that do have gopher problems. This seems to be more so with lands that have light textured soils. Totally in Missoula County there is an estimated 15,000 acres that are infested with gophers. While gophers do cause some crop loss through eating it, this seems to be of little significance in comparison to the amount of damage done through their burrowing and resulting damage to harvest equipment.

Expertise in the area of wildlife have been checked with to see if there are other means of controlling these rodents. Some of the predators include coyotes, foxes, badgers and owls. However, these predators have to reach a population before they can do much of a job in providing adequate control and in some cases the predators themselves create problems to other areas of

wildlife and livestock. Generally this way of control should be considered more as a help than providing an adequate control. Use of disease has also been discussed such as tularemia. However, this disease also affects other rodents such as badgers and rabbits and will also infect man, so this has its potential problems.

Farmers and ranchers in the county definitely feel that they have to have some feasible means of controlling gopher populations. They seem to be willing to take the necessary steps to protect the environment in implementing a gopher control program.

Question No. 11 - not answered on questionnaire

Rodent Questionaire for Powell County:

Question #2:

Over entire acreages of Powell County, rodent damage is quire excessive on grain crops, native grass meadows, alfalfa meadows, tame pasturelands, grass rangelands, and irrigation systems. Rodents are reported not to be doing excessive damage in the forest lands, or have caused any particular problems in recreation areas. In Powell County, the Columbia Ground Squirrel is the most prevalent and is in most of all the area north of Deer Lodge to the Bob Marshall wilderness. The Columbia Ground Squirrel is also in the mountains of Deer Lodge with the Richardson Ground Squirrel prevalent in low valley areas.

Question #11:

To have strychnine rodenticide available for use at the proper time of year and in sufficient strength. Also, to have available a supervised 1080 program which could be implemented when rodent populations have reached a certain point. If there are any other non-chemical controls, then educational programs should be instituted to inform farmers and ranchers and others concerned with rodent control.

2.) Field mice and pocket gophers did damage over winter to Christmas tree plantings, 1 - 2 years old. Acreage small (-10) Also damage by mice to a local nursery.

Lots of Columbian Ground squirrels and pocket gophers in West End of county. They do considerable damage especially to new hay and pasture seedings and any established seedings in light soils. Acreage infested numbered at 5000. Damage is in the farm of killing forage, dirt mounds are hard to mow through, and holes are a danger for livestock stepping in them.

Question No. 11.

Not discussed by CRD Committee

It could be handled by existing groups such as Weed Control Boards, County Agents, CRD or others could help provide "area feedback" to animal work plans of local rodent control.

DISTRICT 2

Blaine County

Chouteau County*

Glacier County

Hill County

Liberty County

Phillips County

Pondera County*

Teton County

Toole County

*District counties not reporting or answering questions #2 and #11.

Question No. 2:

Prairie Dogs - Located mostly on Reservation with samll town in various parts of the county. Fort Belknap Reservation has about three sections with a very high prairie dog population. In this area the forage production for livestock is almost nill. The rest of the county is not affected to any great degree.

Ground Squirrels - Numerous through the county. Major problems is forage consumed, damage to irrigation ditch banks, stock dams, grain crops, and some machinery damage.

Pocket Gophers - Mainly found in hay fields. Damage caused mostly to irrigation facilities and machinery.

Field Mice - Located through the county. Problem in rural areas during fall and winter when they move into graineries and buildings.

Moles - Most damage is confined to Clear Creek area and mountain meadows.

Rats - Infestation in and around Turner. Spreading to Milk River Valley.

Question No. 11:

1. Should be action oriented.

2. Positive method of funding should be established.

3. Borad or commission should have powers enough to make decisions.

GLACIER COUNTY

Question No. 2

Richardson Ground Squirrel

Crop Damage 1972 - 4,000 acres - $140,000

1971 - 2,000 acres - 70,000

Alfalfa & hay crops - no major problem

Range Land - Problem exists but not as noticeable as on crop lands

Recreational areas - not a big problem

Irrigation - Canal and ditch damage

Urban Problems - city dumps - rats

Question No. 11

What would be your recommendations for the establishment of a long range rodent control program in Montana?

Felt that urban areas need help and control. (dumps, elevators, town people) Partly responsibility of counties.

Felt that nature will take care of rodent problems except in case of rats.

Felt that any program should be generated from the public.

Question No. 2:

1. Population explosion in past 2-3 years, basically county-wide coverage, of Richardson ground squirrel.

   Damage widespread in crops and rangeland - estimated 1000 destroyed completely and another 1500 acres of crop damaged in varying degrees. Three or four thousand acres of rangeland damaged noticeably.

2. Main damage of field mice in grain hay stocks, during winter months - substantial loss in these cases.

3. Foothill and mountain areas have this species - Bear Paw Mts. have considerable problem in this area.

4. Skunks are prevalent, throughout county.

5. Prairie dog and Columbia ground squirrels insignificant in our county.

Question No. 11: What would be your recommendations for the establishment of a long range rodent control program in Montana?

1. Intense educational program aimed at farmer-rancher and public awareness of rodent problem.

2. Control substances available for control of rodents.

3. Consider a bounty system for gopher and ground squirrel control.

2. Prairie Dogs:
Grass Range Lands - 20 Acres (50% Destruction)

Richardson Ground Squirrels:
Grass Range Lands or Wasteland - 3,000-5,000 Acres (Little Destruction)
Grain Crops Adjacent to Grass Land - 300-500 Acres (Serious Destruction)

Pocket Gophers:
Grass Range Lands or Wasteland - 300-500 Acres (Little Destruction)
Grain Crops Adjacent to Grass Land - 30-50 Acres (Serious Destruction)

Field Mice:
Primary Problems Limited to Stored Farm Products & Buildings

Moles:
Alfalfa - 500 Acres (Serious Destruction due to mounding, harvest difficulty, & subsequent machinery problems)

Skunks:
Little Problem

(1972)

3. DATE OF DELIVERY: Product received 30-45 days after promised & too late for effective control

STRENGTH & QUALITY OF BAIT: 1:20 formulation reported to be less effective than 1:16 previously available. (Lateness may have been a factor)

TYPE OF CONTAINER: Excellant. Bales of 5, 10# bags easier to handle & store.

PRICE: Acceptable due to demand, but higher than previous bait of stronger formulation.

(PRIOR TO 1972)

DATE OF DELIVERY: Available at distributor's discretion. Any late arrival or shortage was his fault & not the manufacturer's.

STRENGTH & QUALITY OF BAIT: Good Reports

TYPE OF CONTAINERS: Suitable, but not as desirable as the 1972 shipment.

PRICE: Satisfactory

Question No. 11.

What would be your recommendations for the establishment of a long range rodent control program in Montana?

At present, mere protection & continuation of the availability of grain baits should suffice (at least in our situation).

(2)

Prairie Dog Rangeland--see attached map for Bureau of Land Management
BLM Lands have 2935 Acres of Prairie Dogs
Attached list for U L Bend--600 Acre Area and Wildlife
Area of C M Russel (2500 Acres)
Special problems--Protected on Wildlife Range

Richardson Ground Squirrel Agricultural land--Estimate 40,000 acres
Damage to alfalfa, ditches, and irrigated pastures.

Special problems--None

Microtus (Field Mouse) Grain hay--23,000 acres cut for hay.
70,000 acres of wheat
40,000 acres of barley
Damage to hay stacks is extensive each year.

11. What would be your recommendations for the establishment of a long range rodent control program in Montana?

Vast amounts of public lands in Phillips County. The BLM has strict control of the rodent on their lands--private lands should be continually evaluated for damage by the land owner-operator with same person having full knowledge of the control methods avaiable to him. Rodents should not be killed just for the sake of killing-rather they should be controlled only when they become economically damaging to the "other" users of the land. (the rodent must share the land with all other living things if other forces do not moderate its population, when necessary then it is man's responsibility to do so.)

Question No. 2.

It is difficult to assess the exact amounts of rodent damage in Teton County. I imagine this is true in all areas of the state. No surveys were done in the area to determine actual populations, nor is there any research information to indicate the amount of damage that a given population of rodents will do to particular crops.

It is safe to assume that rodents do damage in at least 3 specific areas; 1. the actual injestion of both forages and grain crops; 2. mechanical damage to the root areas through their burrows; and 3. mechanical damage to irrigation structures and water retention structures through their burrowing.

Based on personal experience and individual consultation, rodent populations were up in Teton County in 1972. Whether they were up many thousands, or whether they were more obvious because of the lack of control measures is difficult to determine; however, because of the lack of control, and the result of the reduction in control over the past several years, because of a lack of emphasis on the control when material was available, populations should have increased.

It might be noted here that in 1970, Mr. Norton Minor of the Bureau of Sports Fisheries and Wildlife, approached the Extension Service to set up a Rodent Control District. He felt, at that time, from observation, that rodent population in Teton County were reaching epidemic proportions - two years have passed since then, and if anything, the populations have increased. With this increase, we have an increase in damages, as rodents were found in grain fields, alfalfa fields, dry land range, both irrigated and dry land areas.

Question No. 11.

What would be your recommendations for the establishment of a long range rodent control program in Montana?

A program based on research and need and tightly controlled. Users should be properly trained in the use of these materials. A scientific research program into more effective control measures should be instituted to supplement any future program.

Question 2 Supplement

a. Damage - Field crop, grass lands - Prairie Dog, Richard Ground Squirrel, Pocket Gopher, Woodchuck, 13 Line Gopher. Stored Grains--Deer Mices, Fieldmouse.

b. Approximate acreage

grain - 3000,000 acres
grass and hay fields - 20,000 acres

c. Rodent distribution

1. Prairie Dog - Marias River areas
2. Richardson Ground Squirrel - Entire Range from Sweetgrass hills, south.
3. Pocket Gopher - Sweetgrass Hills area
4. Deer Mice, Field mice - Entire county.
5. Woodchuck - Sweetgrass Hills area
6. 13 Line Gopher -Sweetgrass Hills area.

Question No. 11.

What would be your recommendations for the establishment of a long range rodent control program in Montana?

A program similar to the Weed Control Program, but put bite in the program. Local bases to state on operations. State to local on programs and laws.

DISTRICT 3

Daniels County

Dawson County*

Garfield County

McCone County

Richland County*

Roosevelt County

Sheridan County

Valley County

* District counties not reporting or answering questions #2 and #11.

RICHARDSON GROUND SQUIRREL They did a lot of damage to rangeland this past summer. They seem to be most prevalent where range is in fair and poor condition. The mounds they make cover many acres of rangeland and also creates a weed problem. Always present is the danger to livestock from the holes.

High populations of gophers encourage badgers to move in and this results in more holes and mounds. The subsoils are deposited on top of the rangeland, again discouraging growth of grass and then we have an increased weed problem.

Areas where cropland borders rangeland, the Richardson ground squirrel can do extensive damage to crops. When the range turns dry the ground squirrel moves into the cropland.

Gophers have also caused some damage in the county in irrigation systems and spreader dikes.

MICROTUS (FIELD MOUSE) The population of this species is just medium. A high population of fox, skunks, hawks and badgers in probably the reason for the low population of the field mouse. The major damage they do is to hay and primarily oats hay.

POCKET GOPHER The population is so low they are not significant.

RABBIT Easts haystacks, hayfields, crop and pasture lands. Digs holes which make farming operations more difficult. Kills many small trees during the first two years after planting. (Evergreens are the worst affected.)

BADGER Digs in fields leaving a large mound of earth and a hole which is unproductive and a danger to horses, cattle, etc. In many cases they have caused failures in irrigation ditches, dams, diversions, etc.

RACCOON Damages gardens, buildings and field crops, such as corn. The population has increased in the past few years.

SKUNK Does damage to birdnests and young birds. The main carrier of rabies in the county. Odor causes damage to stored grains.

PORCUPINE Damages trees in field windbreaks and shelter belts. Also the quils damage dogs, cattle, horses, etc.

BEAVER Two cases in the county where damage has been recorded to farms. One by cutting trees out of a shelterbelt. The other by causing stream ponding where it is undesirable.

Question No. 11.

We feel we do not possess the experience and knowledge to offer a long-range rodent control program.

Question No. 2.

Prairie Dog: Most of the damage caused by prairie dogs is to rangeland. The acreage being done is not know but there are several large areas in the county where there is a problem. Most ranchers affected are using or starting to use control measures.

Pocket Gophers: Damage by pocket gophers is limited mostly to water-spreading systems where alfalfa is grown. Presently these areas appear to be isolated parts of the county and no reports of real damage has been reported. Most ranchers, if bothered by pocket gophers, work alfalfa fields in the spring lightly with a disk and harrow.

Field Mouse; Most damage by field mice is restricted to grain hay stacks and control measures around grain storage areas is often applied.

Question No. 11.

What would be your recommendations for the establishment of a long range rodent control program in Montana?

Assistance for rodent control should be available on private lands where rodents are causing economic loss. Also agreements with federal agencies controlling lands should be made so that necessary controls can be taken on federally owned lands.

Question No. 2.

Some general remarks are in order to properly interpret the answers of this questionnaire.

For question No. 1 the prairie dog occurs primarily in range and hay land in McCone County. We estimate there are approximately 5,000 acres and the population is moderate. However, it must be remembered that where the prairie dogs occur they are of high intensity. The accompanying map indicates the general areas in which the prairie dog towns occur.

The pocket gophers in McCone County occur primarily on the hay land, and the area which has been diked to spread water for spring run-off. We estimate there are approximately 60,000 acres which contain pocket gophers. They are given a high economic importance because the tunnels enable dikes to wash out and cause serious damage.

The field mouse is found primarily in oat hay stacks all over the county. At present, they have not presented a serious economic problem to the county, however, the concentration of mice in the hay stack would be high. There was no serious damage to range or crop land.

The Kangaroo rat is present in approximately 10,000 acres in McCone County. It is found primarily in sandy and light soil and could be disastrous, economically, in wheat if the population increases. The last time a serious problem occurred was in the '50's.

The 13 striped gopher is found primarily in pasture lands, dikes and is present all over the county. At present it is not a threat although we estimate about 800,000 acres contained infestations of the 13 striped gopher.

For question No. 3 the strychnine oats worked fine for gophers this year. A formulation of 10 to 1 strychnine oats was ordered from Oregon this year for use on prairie dogs, however, the strychnine oats will not work very good. It would be much preferable to use a 1080 oat.

The McCone County USDA Committee for Rural Development hopes this accompanying explanation and the map is the type of information you were requesting. On the McCone County map, all the area within the blue lines has some degree of infestion of Kangaroo Rat; the red dots and circles are the general areas in which the prairie dog is located. If you have any further questions, we would be happy to answer them.

Question No. 11.

A program without a follow-up or clean-up program is worthless.

ROOSEVELT COUNTY

Question No. 2:

Richardson Ground Squirrel - Occupy total county - do moderate damage to range and grain crops.

Field Mouse - Mouse droppings & urine spoil 1% stored grain. Damage forage supplies (oat hay especially).

Rats - Spoil forage & grain supplies in older graineries.

Moles - Damaging hay meadows.

Question No. 11:

Previous program was reasonably successful. Continued effort should be made in educating the user of rodenticides.

Question No. 2.

Richardson Ground Squirrel: Damage occurs on both crop and rangeland. Greatest damage actually occurs on cropland from infestation originating on rangeland. All areas of the county are affected to some degree.

Rats infestations are a problem on all town dump areas. Individual farm infestations do occur but these can be handled by the individual.

Question No. 11

What would be your recommendations for the establishment of a long range rodent control program in Montana?

That the state of Montana establish a central mixing plant to provide mixed bait to counties at approximate cost. The state would need to finance the construction of the plant but once constructed should be self-sustaining. As indicated in (7) counties would purchase the bait and distribute through a central location or locations in the county at cost to the individual.

2. The prairie dog is present in Valley County in small colonies, which are numerous. However, population is growing and establishing new colonies each year. They establish themselves on range lands. The range grasses in infested areas are destroyed by eating the root system of grasses, leaving the area with holes and mounds.

The Richardson Ground Squirrel has been on the increase in population each year for several years. However, the farmers and ranchers have been baiting each year to attempt to keep them under control. Weather conditions and work load of farmers and ranchers during spring season are factors, which have an influence on effectiveness of control. However, their effort and time alloted has been effective.

The Ground Squirrel damage is mostly to grain crops. They do feed on grass vegetation early in the season. The damage is extensive to grain and forage vegetation.

The year 1972 - 257 operators purchased poison bait, which was 600-10 pound bags, for a total of $1,245.00.
The year 1971 - there were $850.00 bags of poison bait purchased, which would be 425-10 pound bags.

The use of poison baits, to control rodents, will indicate that damage to crops is a concern, because the time element to spread the bait is more costly to the operator, than the bait itself.

The Pocket Gopher is on the increase in the county on irrigated Alfalfa fields, permanent pastures and meadows.
They can be found in the Milk River Valley and Missouri Valley, from West end to East end of the Valley.
The rodent build underground burrows and dens in the field, searching for suculent root systems for food and hibernation.
Yield of forage production is greatly reduced, vegetative stands are reduced, reducing length of years of production.
They create mounds, burrows and dens, which create a hazard and reduction of efficiency of farm machinery operation. They also create a hazard to livestock grazing on the field.
They create a problem in management of irrigation water, by destroying the irrigation ditches, pocket dens for water to erode greater areas by force of water flow.

Microtus (field mouse) - Infestation of the farmstead is a common occurrence each fall, migrating for shelter and food from the fields.
Infestation occurs in feed bins, hay stacks and the household is a common occurrence. Also, shelterbelts, windbreaks and ornamental trees and infestation in city dumps and a place to breed and reproduce.

Rabbits - This rodent population is on the increase, however, our coyote population is also on the increase, which may help to control the rabbits.
The rabbit destroys range grasses, forage crops, cured hays and grain crops.

Question No. 11:

Farmers and ranchers have had a long range rodent control program in Valley county, by each individual operator purchasing bait. Every farmer or rancher does not have the problem. Availability of bait should be made available each year.

No controls of Richardson Ground Squirrel and other rodents could cause a

very heavy increase in population of rodents, which could cause a great economic loss to the county.

Government agencies, which have control of lands in the county, should be concerned with control of rodents.

DISTRICT 5

Broadwater County

Cascade County

Fergus County*

Judith Basin*

Lewis & Clark County

Musselshell-Golden Valley Counties

Meagher County*

Petroleum County*

Wheatland County*

* District counties not reporting or answering questions #2 and #11.

Question #2

We are concerned primarily with the Richardson Ground Squirrel. It is of primary concern in dryland pasture. Dryland grain and in hay crops. Considerable damage to ditch and canal banks have been reported. An estimate of 10,000 acres of hay affected by the Richardson Ground Squirrel was made. For Broadwater County we had one report of ground squirrel chewing holes in buried plastic line for a stock water facility.

Concerning the field mouse. An estimated 500 acres in rangeland have abundant populations of field mice. Forest service reported a number of areas sited where field mice burrow under the snow in areas and plow up the soil, eat grass roots and weaken grass stand to the extent it would allow weed infestation to occur. There has been some hay stack damage (manure, runways & nests) and have been common cause of chewed strings and plastic twine in bales. Some damage to stored grain has been reported.

Question #11

The need for rodent control is significant in Broadwater County. Control of selected species is necessary. The rodent problem is getting worse and the program must be continued. There should be more research into biological control.

RODENT QUESTIONNAIRE

2.) The present prairie dog towns are located on rangeland, and they cover approximately a 40-acre area, in which they clear large patches around their holes so that the grass isn't growing in the immediate area. Also, prairie dog holes are very detrimental in trying to herd cattle in these areas.

The Richardson Ground Squirrel - There is a total of 364,852 acres of cereal grain production land in Cascade County. The producers felt that approximately 25 per cent of this acreage has various degrees of injury due to the gophers. They eat the new winter wheat and spring grain plants, either killing the plants or in some cases, delaying the maturity of the plants.

There is approximately 32,000 acres of irrigated alfalfa in the county. The gophers do some damage before the individuals irrigate; once they start irrigating, the gophers either drown out or move to another area. Producers do have some damage from the gophers digging into the main canals or ditching, causing leaks. The gophers also reduce the yield in the hay lands, which consist of 37,000 acres. The major problem of the gophers in the alfalfa and wild hay land is that you have a lot of sickle damage from the mounds. Also, you lose alot of manhour time cleaning rocks and mud from the sickle bars. This is also true in some of the grain harvesting areas pertaining to combines. ROUGH RIDING FOR PICKUPS.

Pocket Gophers - The population of the pocket gopher is increasing rapidly in all of the river and creek bottom areas and on many of the upper grassland meadows. They do considerable damage by cutting off the roots of the alfalfa, and in some cases, they have completely destroyed a crop in alfalfa in 3 years. They also are causing damage in home gardens and in lawns. It is difficult to estimate the damage they are doing in approximately 500,000 acres of alfalfa, tame and wild hay, and upper mountain meadows.

Field Mice - They are doing damage in many areas by gnawing holes in the grain bins, they destroy baler twine, they pollute many of the straw and hay stacks, and they can cut many of the strings, making it very difficult to handle bales. They also ruin sacks of certified seed, as well as sacks of feed.

Muskrats were discussed, and they seem to be doing damage on some canals, ditches and dams.

Question #11:

It was specifically emphasized that in many instances the long range program does not take care of an immediate situation in an area. There may be a plan, but when it comes to implementing it, it turns out that it is very difficult. They would like to have a plan which they term "short range" for immediate operation, which could be interpreted as a long range program.

Having a more accurate method of determining the numbers of the various rodents could be desirable.

It was also a general concensus that before a chemical that has been used over the past years is outlawed, a replacement should be developed.

Some individuals have noted that the rodents do get some type of diseases which seem to wipe them out of an area, and they felt this should be studied because there may be some way in which the disease organism could be initiated into a heavy population.

If the state of Montana cannot come up with an excellent control program, then they felt that special improvement districts should be studied to see if they could serve the purpose.

(Question 2)

Population numbers of both the Richardson and Columbia ground squirrel are increasing in the range areas; especially in the area between Wolf Creek and Augusta. Main damage is to grazing areas. Suburban dwellers in the range and forested areas also complain about the damage done.

Pocket gopher infestations are prevalent in the Wolf Creek-Dearborne area particularly to irrigated alfalfa and grass hay fields. In addition to the loss of forage, damage is incurred to machinery in attempt to harvest these fields.

Prairie dogs and field mice are of minor importance.

Irrigators complain of rodent damage to their ditches which often results in washouts during periods of critical water demand.

(Question 11)

1. Consider packaging the rodenticide in smaller lots than 10 pound bags for the smaller landowner.

2. County agents and other information agencies need a publication available to provide to the public on non-poisonous methods of controlling rodents.

2.) Richardson ground squirrel is heavily infesting almost all dry land range and timber lands. Grass destruction is high. Little damage seen as yet to dry land crops, probably due to summerfallow.

Pocket Gophers are a perennial problem on irrigated lands. Destruction of alfalfa, grass, and damage to irrigation ditches increases each year. Approximate acreage--8,000 Musselshell; 7,000 Golden Valley.

11.) Release it for sale by private business (feed supply, etc.) with accompanying use and safety literature developed and supplied by Extension.

DISTRICT 7

Beaverhead County

Gallatin County*

Jefferson County

Madison County

Silver Bow County

*District counties not reporting or answering questions #2 and #11.

Question No. 2.

Type of damage

Pocket gophers - mainly equipment damage - dirty hay - reduced yield

Ground Squirrels - damage to equipment

Mice - grain damage - damage to hay. Some problems with girdling trees and shrubs

Approximate acreage:

Pocket gopher - 40,000 acres - Alfalfa and grass rangeland most seriously affected. Mice affect some haystacks - particularly oat hay.

Question No. 11.

What would be your recommendations for the establishment of a long range rodent control program in Montana?

Make material available as needed and let indivuduals control their own. Effective rodenticide should be made avaiable to people that need it.

Cooperative Extension Service
MONTANA STATE UNIVERSITY, BOZEMAN, U. S. DEPARTMENT OF AGRICULTURE, AND MONTANA COUNTIES COOPERATING
Reply to
P. O. BOX B
MADISON - JEFFERSON COUNTIES
WHITEHALL, MONTANA 59759
TEL 287 - 3282

November 6, 1972

JEFFERSON COUNTY

Type of damage caused by ground squirrels is mainly damage to forage and grain crops. Estimated acreage damaged is about 3000 acres scattered throughout Jefferson County.

Pocket Gopher - Main damage caused by pocket gopher is in hay fields, grain crops and irrigation systems. Some areas that are heavily infested with pocket gophers have caused damage to haying equipment.

Hay production has been effected by pocket gophers. Because of producers going to sprinkler irrigation systems the pocket gophers population has increased.

Estimated acreage effected is about 5,000 acres throughout Jefferson County.

Irrigation systems have been effected with some areas near washouts occuring on main irrigation ditches.

Question No. 11.

Lift ban on 1080

Continued research in rodent control both chemical and non-chemical

Area wide control programs instead of scattered individual efforts.

Studying areas to determine if it is an economic problem and then if so, plan a program that is both feasible and safe.

Areas effected in this area are centered around crop, hay, irrigated farm ground and damage to equipment and livestock.

November 6, 1972

MADISON COUNTY

Type of damage caused by ground squirrels is mainly damage to forage and grain crops. Estimated acreage damaged is about 6,000 acres scattered throughout Madison County.

Irrigation systems are effected somewhat but not to the extent caused by the pocket gophers.

Pocket Gopher - Main damage caused by pocket gophers is in hay fields, grain crops and to irrigation systems. Some areas that are heavily infested with pocket gophers have caused machinery and equipment damage.

Hay production has been effected by pocket gophers because of producers going to sprinkler irrigation systems thus the pocket gopher population has increased. This has been more evident on the East Bench Irrigation Project then else where.

Estimated acreage effected is 15,000 acres throughout Madison County.

Irrigation systems throughout Madison County have been effected with some near washout occuring in main irrigation ditches.

Badgers have caused some damage in pastures and fields.

Question No. 11.

Lift ban on 1080. Continued research in rodent control - both chemical and non-chemical. Areas with control programs instead of scattered individual efforts. Studying areas to determine if it is economic a program and then if so, plan a program that is both feasible and safe. Areas effected in this area are centered around crop, hay, irriagation farm ground and damage to equipment and livestock.

2.)

Considerable damage by the Columbia Ground Squirrel has been caused to farmers and ranchers having high mountain meadows and alfalfa fields throughout the mountain valleys of Silver Bow County.

Other areas of economic damage by the ground squirrel is in the areas of cemetaries, ornamentals, and gardens throughout the urban area of Butte. We do receive a very large number of requests for information on control of these critters.

Question No. 11:

What would be your recommendations for the establishment of a long range rodent control program in Montana?

Rodent control programs should be established through an active county system whereby direct lines of responsibility are maintained through the state department of agriculture in the control of not only herbicides, but rodenticides and other pesticides as well.

Financing should be a combination of state and county through the cooperative agreement system now used by the Cooperative Extension Service with boards of county commissioners.

DISTRICT 8

Big Horn County*

Carbon County*

Park County

Stillwater County

Sweet Grass County*

Treasure County*

Yellowstone County*

*District counties not reporting or answering questions #2 and #11.

Rodent Questionnaire:

No. 2.

Prairie Dog: The prairie dog has only been noticed in two places in the county. He is of little economic trouble and damage is limited to five acres or less. His effect is on grass rangeland.

Richardson Ground Squirrel: This is the most damaging rodent within Park County. He has an effect on all crop land, hay land, range land and pasture land. This amount of land totals more than 617,000 acres. The amount of damage to these acres varies from no damage to 100% damage. It was figured that 3/4 of the acres are damaged 50-60%.

The type of damage includes: Reduced grain yields, less available water, interference with irrigation, and machine damage. When land is being grazed heavily their damage is increased. Maybe just noticed more.

Columbia Ground Squirrel: This squirrel is found only in our forest ranges. He is very high in population, but not sure that he is of economic importance. The damage he causes was not easily determined because he is not on private land.

Pocket Gopher: The pocket gopher is found throughout the county in varying degrees. Mainly found in the more sandy soils, along the creek bottoms and in mountain meadows.

They cover about half as many acres as the Richardson Ground Squirrel, but his damage is as bad and worse in most places. They have taken over meadows which are overgrazed.

The dirt mounds that they form are very damaging to machinery in the hay fields and restricts yields of all crops. Crop restriction is much worse by the pocket gopher on the land that they infest, than that by mice or the ground squirrel.

Mice: Mice are present on 100% of the total acres in Park County. Most of their damage is done on hay lands, young trees, (in shelterbelts and forest reestablishment) and grain contamination.

They are an economic problem in the county, but there is a bait available to help control them.

Others:

Skunks: Skunks are very high in population and their damage to Park County is to the recreational industry. This is due to the reports out of rabid skunks, although we have not had any cases in our county.

Porcupines: Porcupines are very high in population in the forest land and high all over the county. Their damage is mainly to the trees by girdling them.

Question No. 11:

1. Make a supply of bait of sufficient strength available for use in the county.
2. Set up yearly training sessions and other public information for those.
3. Let the county commissioners have some control on the need and use of the bait.

2.) Damages caused in Stillwater County

A. Prairi dog - One large infestation of pasture land reported. Covers nearly a section. Most prairie dog towns are lesser acreage. Badger holes are a problem within towns causing additional danger to livestock. Forage loss and broken legs are the biggest problem.

B. Richardson Ground Squirrel - common throught the county. Crop and forage losses are the concern. Seem to continue regardless of control measures.

C. Pocket Gopher - mostly in hay meadows. Seem to have increased this year. Reduction in hay yields and causes some equipment problems.

D. Field mouse - cause extreme damage to stored hay. Zinc phosphide was very effective. Where can we obtain more? Some years they move into buildings and cause a lot of damage and loss.

E. Skunks - increasing in numbers. Towns report problems especially in abandoned buildings and dumps.

F. Bear - reported in sheep country adjacent to forest service lands. Some loss reported each year.

G. Coyotes - numbers increasing rapidly in all parts of county. Fawn population down in deer, sheep losses, now causing problems with cattle.

H. Racoon - nuisance No. 1. After birds, corn, feed, and growing in numbers.

I. Red Fox - numbers increasing. Causing problems on and around farmsteds.

11.) Include farmer and rancher representation on all boards. Suggest a statewide board for continuity in control measures. Possible funding similar to Wheat Research and Marketing Association. Emphasis on research as there is entirely too much complaint about what exists rather than what could be. Bounty programs were questionable because of results. Why not try sterilization programs on bothersome species. We have carriers all we need is the chemical and control could be had by merely eliminating reproduction.

DISTRICT 9

Carter County*

Custer County*

Fallon County*

Powder River County

Prairie County

Rosebud County*

Wibaux County*

* District counties not reporting or answering questions #2 and #11.

#2 RODENT DAMAGE IN POWDER RIVER COUNTY

In Powder River County, the only rodent of significant economic importance is the prairie dog. A brief study of the prairie dog will give anyone a complete run-down of the rodent's diet and habitat. Because of these two factors, prairie dogs are of major economic importance in Powder River County.

Prairie dogs eat the grass that covers the ground around their towns; putting them in direct competition with livestock, their homes consist of openings in the ground which create a hazard for livestock and make it impossible to ride a horse across the area. Many ranchers feel that the prairie dogs create an erosion hazard by their living habits.

Dense populations of prairie dogs increase the threat of infectious diseases. Former government trappers report that prairie dogs have carried the bubonic plaque.

PRAIRIE DOG ACRES

Powder River County has a total of 2040 acres of grass rangeland on which efforts have been made to control the prairie dog population. The Ft. Howes District Ranger Station reports that they know of 30 acres of prairie dogs on forest lands in Powder River County. The Ashland Ranger District also reports 30 acres in Powder River County.

It is the opinion of the C. R. D. that there are approximately 6500 total acres of prairie dog infested land in Powder River County. This figure was arrived at by visiting with ranchers, government employees and local residents who are concerned with protecting the prairie dog.

#11

We feel that we are in a very poor position to make recommendations. However, we do feel that some type of control is definitely necessary. A stronger type of poison is needed.

COUNTY PRAIRIE

COLOR CODED COUNTY MAP INDICATING DISTRIBUTION OF RODENTS

PRAIRIE DOG

POCKET GOPHER

FIELD MOUSE

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QUESTION # 2.)

Prairie Dogs = mostly on range and pasture land, approx. 2000 acres damaged, forage eaten and hazardous to livestock due to holes.

Pocket Gophers = Mostly on irrigated and sub-irrigated hay land, approx. 3000 acres damaged, loss of irrigation water, and damaged to machinery and forage.

Field Mice = mostly in hay stacks and granaries, damage to grain and hay, making it unplatable for livestock feeding.

QUESTION # 11.

We feel a program should be established, once established with proper training of personnel, including farmers and ranchers, it should include all land in the county.

3.)a. How would you evaluate the 1972 rodent bait program (date of delivery, strength and quality of bait, type of container, and price)?

b. How would you evaluate the same factors prior to 1972?

These two questions provide the means to evaluate the 1972 rodent bait distribution program and pre-1972 programs. To a degree the evaluation can serve as a comparison between the two programs which may help in establishing further programs.

The delivery of the baits in 1972 occurred in the months of June and July, while the bait available from the Bureau pre-1972 were available year around. The price of the 1-20 strychnine bait in 1972 was $.25 to $.27 per pound and the price of a comparable Bureau bait was $.23 per pound. The strength of the bait was not the most appropriate bait for some rodent species, for example, the Columbia Ground Squirrel bait should be 1-10 and Pocket Gopher baits should range from 1-12 to 1-16 baits. The container was made of heavy paper and came in 10# lots.

The bureau container was made of 4-ply paper with a plastic liner and came in 10#, 25# and 50# lots.

Question 3 a & b

COUNTY	DATE OF DELIVERY	STRENGTH	QUALITY	TYPE OF CONTAINER	PRICE
DISTRICT 1					
	a. Late	Not strong Enough		For C. Ground Squirrel	
Deer Lodge	b. Better all around				
	a. Need 1-12 strychnine formulations				Fair Price
Flathead	b. Reg. government supervised program				
	a. Late	Not strong enough		Adequate	Reasonable
Granite	b. No comment				
	a. Poor-baits not strong enough			-	-
Lake	b. Much better				
	a. Late	Effectiveness low		Easier to handle than Bureau's	
Lincoln	b. On time				
	a. Late	-	Good	O.K.	Reasonable
Mineral	b. Satisfactory				
	a. Late	Need 1-12 bait		No complaints	No complaints
Missoula	b. On time	Stronger		No complaints O.K.	O.K.
	a. Late	Not strong enough for C. G. Squirrel			O.K.
Powell	b. Better than 1972				
	a. Poor	-	-	-	-
Ravalli	b. Availability good	Better	No organized effort		
	a. Late	-	-	-	-
Sanders	b. Availability good				
DISTRICT 2					
	a. Late	Not strong enough		O.K.	O.K.
Blaine	b. Everything O.K				
	a.		No complaints		
Chouteau	b. Good				
	a. Slow, late	O.K.	O.K.	Good	Reasonable
Glacier	b. On time	More effective		Heavier and not labeled as well	
	a. Late, not enough	O.K.	O.K.	O.K.	High
Hill	b.	no problems in past			
	a. Too late	Less effective		Excellent	Higher
Liberty	b. On time	Good reports		O.K.-'72 better	Satisfactory
	a. Late	O.K.	O.K.	O.K.	O.K.
Phillips	b. On time	-	-	-	-
	a. Late, people felt bait was weak; good job if directions were followed				
Teton	b. -	More effective		-	-
	a. Late, bad	Bait not totally acceptable		O.K.	O.K.
Toole	b. On time	Better			Reasonable

COUNTY	DATE OF DELIVERY	STRENGTH	QUALITY	TYPE OF CONTAINER	PRICE
DISTRICT 3					
	a. Late	O.K.	O.K.	O.K.	O.K.
Daniels	b. On time when they want				
	a. -	Weak for prairie dogs		-	-
Garfield	b. Satisfactory				
	a. Gophers O.K.-Prairie Dog-did not work too good				
McCone	b. Same as 1972				
	a.		Good		
Richland	b. Similar				
	a. Late	-	O.K.	Desirable	Too High
Roosevelt	b. When needed				Too High
	a. Late	O.K.	O.K.	-	-
Sheridan	b. On time				
	a. Late	R. G. Sq.-OK- Other rodents-No			Within reason
Valley	b. On time	More effective			
DISTRICT 5					
	a. Late	O.K.	O.K.	O.K.	O.K.
Broadwater	b. -	More effective		10# bags not avail.	-
	a. Late	Need 1-16		O.K.	High
Cascade	b. OK				
	a. Late	O.K.			
Judith Basin	b.	Stronger			Same price-all
	a. Late	O.K.			
Lewis & Clark	b. Available sooner	-	-	-	-
	a. Late	Very good			
Musselshell-Golden Valley	b. Easier obtained	-	-	-	-
DISTRICT 7					
	a. Late	Effectiveness Unknown		-	-
Beaverhead	b. No - time	?			
	a. Late	Limited		-	O.K.
Jefferson	b. On time	More effective			
	a. Late	Limited		-	O.K.
Madison	b. On time	More effective			
	a. Late	O.K.	O.K.	O.K.	O.K.
Silver Bow	b. Earlier				

COUNTY	DATE OF DELIVERY	STRENGTH	QUALITY	TYPE OF CONTAINER	PRICE
DISTRICT 8					
	a.	No Complaints			
Big Horn	b. No Problems				
	a. -	Short Supply-Not strong enough			-
Carbon	b. Adequate supply				
	a. Late-Poor	Poor	-	O.K.	O.K.
Park	b. Everything very well				
	a. -	?	?	-	-
Stillwater	b. No problem	Stronger-1-10		-	O.K.
	a. Late	Satisfactory			
Sweet Grass	b. Satisfactory	-	-	-	-
	a.	Same as Rosebud			
Treasure	b. See Rosebud				
DISTRICT 9					
	a.	Unsatisfactory control			
Custer	b. Satisfactory				
	a. Late	Not Strong enough		O.K.	Fair
Powder River	b. Unqualified to judge				
	a. Late	Satisfactory		-	Too High
Prairie	b. About the same				More reasonable
	a. Administration	Good ?	?	O.K.	-
Rosebud	b. No problems				

Question #4

#4. How many pocket gopher burrowing machines are available in your county? Has the demand exceeded the supply?

The "burrow-builder" is designed to construct an artificial burrow and bait it with poison baits in one operation. Its effectiveness is dependent upon the gophers finding the artificially constructed runway and using it long enough to find the poisoned bait. This machine works best in areas with moist soils which in the arid west means either spring or fall operations.

Question #4

COUNTY	Number of Burrowing Machines	Has Demand Exceeded Supply?
DISTRICT 1 Deer Lodge	None	-
Flathead	1	Transit difficult
Granite	None	-
Lake	1	No
Lincoln	1 owned by LCD	Not as far as we know
Mineral	1	No
Missoula	7	Demand meets supply
Powell	1 or more	Not practical
Ravalli	0	-
Sanders	2	At times
DISTRICT 2 Blaine	1	No
Chouteau	3	No
Glacier	1 - private	No
Hill	2	No
Liberty	None	No
Phillips	None	-
Teton	None	No
Toole	None	
DISTRICT 3 Daniels	None	-
McCone	3	No
Richland	1	No
Roosevelt	None	Need Machine
Sheridan	None	-
Valley	2	Yes

Question # 4

COUNTY	Number of Burrowing Machines	Has Demand Exceeded Supply?
DISTRICT 5		
Broadwater	None	Have never been asked for one
Cascade	7	We have enough machines
Garfield	None	-
udith Basin	Some	No
Lewis & Clark	1	No
Musselshell-Golden Valley	2 - private	Yes, but ranchers do not seem to want to purchase the machine.
DISTRICT 7		
Beaverhead	9 or 10	No
Jefferson	10	No
Madison	10	No
Silver Bow	None	-
DISTRICT 8		
Big Horn	4	No, not at present time
Carbon	None on forest	
Park	None	1 private
Stillwater	1	No
Sweet Grass	2	1 machine available this year, other being built, concern increasing
Treasure	-	-
DISTRICT 9		
Custer	None	-
Powder River	None	-
Prairie	None	N.A.
Rosebud	2	Not really, both are individually owned but available

Questions #5 & 6

#5. Have any rodent surveys, studies or research ever been conducted in your county? Yes_____ No_____. If yes, indicate year and organization conducting study.

#6. Do you know if non-chemical procedure for controlling rodents have been utilized in your county? Yes_____ No_____

Explain:

DISTRICT 1	5 Yes	5 No	6 Yes	6 No	EXPLAIN
DEER LODGE		x		x	Shooting
FLATHEAD	x			x	#5 - Dr. Donald Spencer - Bureau - 1946 #6 - Trapping
GRANITE		x	x		Trapping and shooting
LAKE		x	x		Traps for gophers - with poor control
LINCOLN	x		x		#5 - Enclosed surveys #6 - Traps, sulfur bombs
MINERAL		x	x		Trapping and shooting
MISSOULA		x	x		Trapping, shooting, flood irrigation
POWELL	x			x	#5 - 1962 #6 - Shooting
RAVALLI	x		x		#5 - Rocky Mtn. Lab. - studies on disease & population #6 - Shooting and trapping
SANDERS		x		x	--
DISTRICT 2					
BLAINE	x		x		Shooting
CHOUTEAU		x		x	--
GLACIER		x		x	--
HILL		x	x		Only non-chemical approach - 22 rifle
LIBERTY		x	x		Shooting
PHILLIPS	x		x		#5 - Bureau of Land Management - on going #6 - Sport hunting
TETON		x		x	--
TOOLE		x		x	--

DISTRICT 3	5. Yes	5. No	6. Yes	6. No	EXPLAIN
DANIELS		x	x		Shooting - not effective
GARFIELD		x		x	--
MC CONE	x		x		#5 - 1950-56,69 - Bureau of Sports Fisheries & Wildlife #6 - No
RICHLAND		x	x		Trapping gophers
ROOSEVELT		x	x		Rifle target practice
SHERIDAN		x		x	--
VALLEY	?	?	x		Trapping and shooting
DISTRICT 5					
BROADWATER		x	x		Trapping and shooting
CASCADE		x	x		Shooting and trapping
GOLDEN VALLEY	x		x		#5 - Fish and Game - Consolidation Coal Company #6 - Gasing (Carbon Monoxide)
JUDITH BASIN		x	x		Trapping and shooting
LEWIS & CLARK	x		x		#5 - Years ago by Bureau #6 - Shooting and trapping
MUSSELSHELL					
DISTRICT 7					
BEAVERHEAD		x	x		Shooting - kids trapping - both insignificant
JEFFERSON	x			x	#5 - Kansas State University - 1972 #6 ----------
MADISON	x			x	Same as Jefferson
SILVER BOW		x	x		Trapping - poor results due to lack of experience
DISTRICT 8					
BIG HORN		x	x		Trapping and shooting
CARBON		x		x	Not in forest land
PARK	x		x		#5 - Sometimes in 1930's - because of disease #6 - Trapping and shooting
STILLWATER		x	x		Shooting and trapping
SWEETGRASS		x		x	--
TREASURE					

DISTRICT 9	5. Yes	5. No	6. Yes	6. No	EXPLAIN
CUSTER	x		x		#5 - Extension office 1968 #6 - Shooting
POWDER RIVER		x		x	? Unable to contact Bureau
PRAIRIE		x	x		Trapping
ROSEBUD	x		x		#5 - Acreage survey 1970 - by extension #6 - Macaber or Victor traps, shoot prairie dog

#7. Finances

How would you suggest the state support a comprehensive rodent control program? Consider such items as (state general fund, or mill levy, county general fund or mill levy, financial support only from individuals desiring control of rodents).

#8. Do you believe that training should be provided to farmers - ranchers and others utilizing rodenticides? No_____ Yes____

Explain:

QUESTIONS #7 & 8

DISTRICT 1	7. FINANCES	8. TRAINING	Yes	No	COMMENTS
DEER LODGE	County General Fund		x		Use
FLATHEAD	Individuals			x	Timing more important
GRANITE	Co. Gen. Fund & State individuals		x		Use-Safety
LAKE	County General Fund			x	Instructions only
LINCOLN	Individuals			x	1080 only
MINERAL	County fund		x		--
MISSOULA	Individuals - Emergency Co. Fund State and Federal		x		Usage
POWELL	County General Fund		x		Usage
RAVALLI	Individuals		x		Alternative methods
SANDERS	County buy bait - individuals reimburse		x		Slide series with tape - bulletins
DISTRICT 2					
BLAINE	No comment		x		Not sure how!
CHOUTEAU	State and county		Maybe		New chemicals only
GLACIER	State or Federal - County reimburse			x	With literature distributing agent only
HILL	Individuals desiring control		x		Younger farmers & ranchers
LIBERTY	Individuals		x		Educational material
PHILLIPS	Combination-Co. & State General Fund plus cost share individuals		x		Voluntary - ½ day school 2 times per year
TETON	State supported - individual cost share		x		Field demonstration
TOOLE	Individuals - state and local program		x		Precautions - chemicals available

DISTRICT 3	FINANCES	8. TRAINING	Yes	No	COMMENTS
DANIELS	Individuals - County-State		x		--
GARFIELD	Co. General fund or mill levy			x	Not unless problems of control increase
McCONE	Co. & State mill levy -Bureau of Sports Fisheries, & Wildlife			x	Farmers & Ranchers not handle bait
RICHLAND	Individuals		x		County agent or state
ROOSEVELT	State General Fund for Rodenticides - individuals		x		Use
SHERIDAN	Mixing plant in state to county - individuals			x	Materials only
VALLEY	Individuals		x		Instruction sheets
DISTRICT 5					
BROADWATER	State-County-Individual reimburse			x	People would not attend
CASCADE	State Rodent Fund-Special Improvement-Districts-Individuals			x	Instructions attached
GOLDEN VALLEY	Individuals		x		Pamphlet
JUDITH BASIN	Undecided		x		Information sheet only
LEWIS & CLARK	Individual		x		Safety-usage
MUSSELSHELL	Individual		x		Pamphlet
DISTRICT 7					
BEAVERHEAD	Individuals		x		Storage & usage
JEFFERSON	State General Fund-Co. Fund Individuals		x		Proper use & other means of control
MADISON	" " " "		x		" " "
SILVER BOW	County basis		x		Use

QUESTIONS #7 & 8

DISTRICT 8	7. FINANCES	8. TRAINING	Yes	No	COMMENTS
BIG HORN	Individual		x		Slides, film, TV, radio, pap.
CARBON	State General Fund			x	---not on forest
PARK	Individual basis - like weed program		x		-------project program placement Once a year, handling, care
STILLWATER	Self-supporting - Rodent District		x		Usage
SWEET GRASS	General Control Program			x	Written instructions
TREASURE	Individual		-	--	
DISTRICT 9					
CUSTER	?			x	--
POWDER RIVER	County mill levy			x	Directions only
PRAIRIE	Individuals-Emergency Co. funds		x		Prairie dogs & field mice-individual basis
ROSEBUD	County general fund - Ind. reimburse		x		Radio, TV, papers, farm journals

Questions #9 & 10

#9. Do you believe that some rodenticides should be restricted in terms of their application and use? Yes___ No___

Explain:

#10. (a) Have any cases of primary non-target (man, animals) poisoning been observed in your county? Yes___ No___

(b) Have any cases of secondary poisoning been observed in your county? Yes___ No___

Explain:

	9. Yes	9. No	EXPLAIN	10a Yes	10a No	10b Yes	10b No	EXPLAIN
DISTRICT 1								
BEER LODGE	x		Rodenticides like 1080 should be restricted		x		x	--
BLATHEAD		x	Use government programs for toxic compounds	x			x	Possibly
GRANITE	x		Rodenticides like 1080 should be restricted		x		x	--
LAKE	x		The same as in past years		x		x	--
LINCOLN	x		Controls are ok if they don't bother effectiveness of program	x			x	10a - horses
MINERAL	x		1080		x		x	--
MISSOULA	x		Some restrictions needed		x		x	--
RAVALLI	x		Restrict 1080 - license users of toxic compounds	x			x	Anything and everything
SANDERS	x		Probably cyanide-untrained use too dangerous	x			x	Grasshopper control 6 killed
POWELL	x		1080-also restrict use & applic.		x		x	--
DISTRICT 2								
BLAINE			Do not know enough about subject		x		x	
CHOUTEAU	x				x	x		Magpies
GLACIER			Not enough known of material to determine if it should be rest.		x		x	--
HILL	x		Powerful rodenticides should be handled with extreme care		x		x	Not aware of any
LIBERTY			Not familiar enough to offer answer		x		x	1080 - dogs
PHILLIPS	x		Those with secondary effects should be restricted	x			x	Possible eagle death- strychnine
TETON	x				x		x	--
TOOLE	x		For the well being of the ones that do not read or follow dire.	x		x		10a - birds 10b -cats,dogs eating rodents
DISTRICT 3								
DANIELS	x		Persons inexperienced and untrained should not handle	x		x		10a & 10b - dogs
GARFIELD		x	Not those in present use	x			x	10a - horse 10b - none reported
McCONE	x		Keep in handles of responsible people		x		x	None known
RICHLAND		x	If only used for intended purposes		x		x	--
ROOSEVELT		x	Users should be knowledgable		x		x	--
SHERIDAN	x		Strychnine rodent bait not a major hazard - no restriction	x			x	10a - horse
VALLEY	x		Restricted use in recreation and urban areas		x		x	10a. none 10b. possibly cats

	9.			10a.		10b.		
	Yes	No	EXPLAIN	Yes	No	Yes	No	EXPLAIN
DISTRICT 5								
BROADWATER	x		-		x		x	--
CASCADE	x		On highly toxic compounds		x	x		Magpies & blackbirds where gophers have been poisoned
GOLDEN VALLEY				x		x		10a. - 1 bore 10b. - cats-zinc phosphide
JUDITH BASIN		x	--	x		x		However, I am sure there are some
LEWIS & CLARK	x		In areas of high density	x		x		Death of birds
MUSSELSHELL	-	-						
DISTRICT 7								
BEAVERHEAD	x			x			x	10a. - two horses lost to careless use
JEFFERSON	x		Again referred to training & proper use of rodenticides		x		x	None observed
MADISON	x		" " " "		x		x	" "
SILVER BOW	x		Should be handled through responsible people		x		x	--
DISTRICT 8								
BIG HORN	x		Depends on many factors		x		x	--
CARBON	x		a. deadly to domestic & rare endangered animals-b.high tox.		x		x	One reported in 1930's
PARK		x	--		x		x	--
STILLWATER	x		Those that were harmful if missused		x		x	Cats and other animals from magpie baits
SWEET GRASS	x		--		x		x	
TREASURE	x		Same as Rosebud				x	Badgers feasting on prairie dogs
DISTRICT 9								
CUSTER	x		--		x		x	--
POWDER RIVER	x		--		x		x	
PRAIRIE	x		Only sold to those who know how to use it		x		x	--
ROSEBUD	x		Carbon Bisulfide only in hands of qualified personnel		x		x	Unknown

Supplement Information Not Obtained Through The Survey

We are enclosing for review a map on page 78 showing the distribution of the Norway rat in Montana. In many of the areas indicated, programs to suppress or eradicate the Norway rat habe been carried out for many years. A prime example is in the Lewistown area and surrounding communities. The Department of Health and Environmental Sciences program in the area of solid waste, with its goal of establishing sanitary landfills in the place of open dumps will help to suppress the Norway rat population in the state. While the control of this rat can be accomplished in Montana cities and towns, the control in rural areas with its abundant supply of foods will make it difficult to control them. Sanitatation within communities is the real key for controlling the Norway rat.

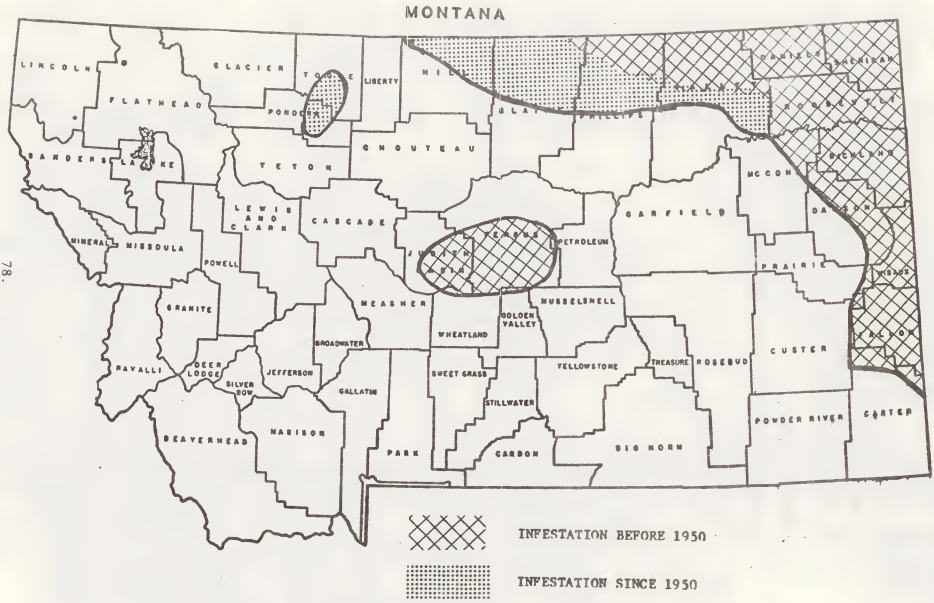
Several of the districts also indicated that a number of other rodents or other animals have at times caused economic damages in their counties. These species include, but are not limited to the; Kangaroo Rats, Rabbits, Norway rat and other species.

Enclosed are some additional maps indicating the relative location of the five rodents species in Montana. The first set of maps are from a publication entitled "Control of Rodent Pests in Montana" by L. C. Gates, U. S. Biological Survey, Bulletin No. 151, February 1957, issued by the Montana Extension Service. The maps may be found on pages 79 and 80.

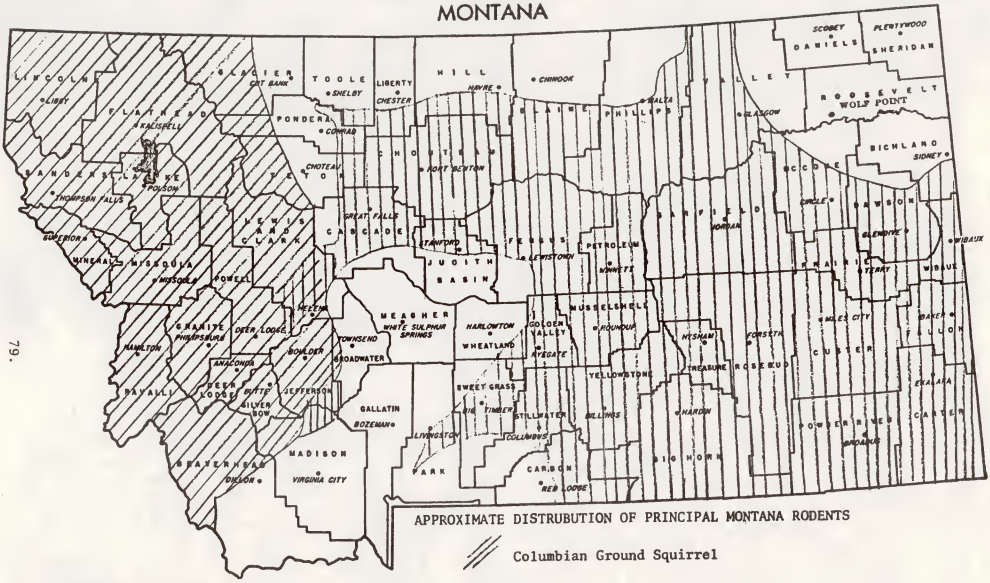
A map from a publication entitled "Distribution of Some Mammals in Montana I. Mammals Other Than Bats", by Robert S. Hoffman, Philip L. Wright, and Fletcher E. Newby, Department of Zoology, University of Montana, Missoula and Montana Fish and Game Department, made in United State of America, reprinted from Journal of Mammalogy, Vol. 59, No. 3, 22 August 1969, pp. 577-604, may be found on page 81.

This map again only shows the relative location of the species indicated. This series of maps along with the maps on pages 9 through 13 should provide the reader of this report with a good idea of the distribution of five species in the state.

NORWAY RAT 1968



Department of Health and Environmental Sciences

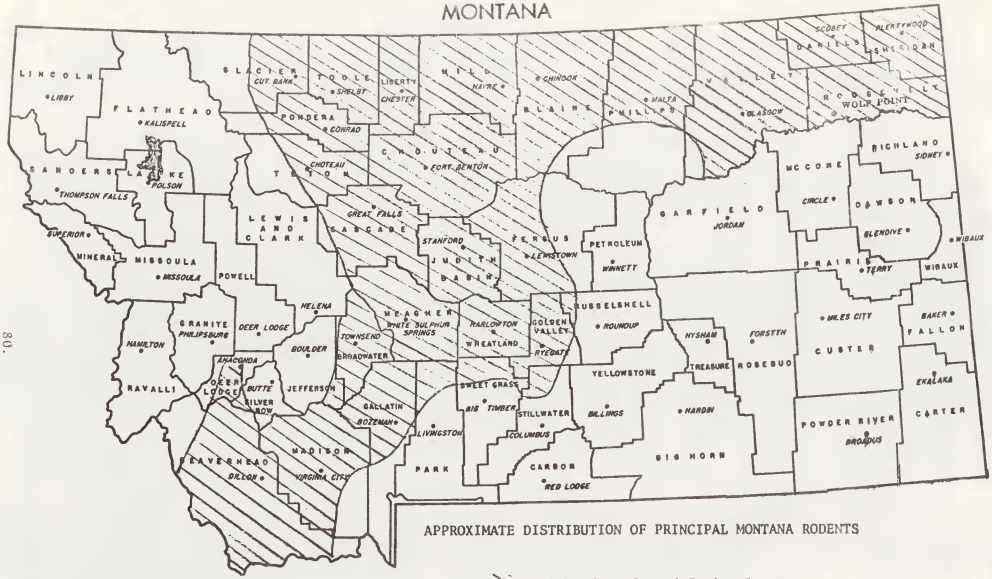


APPROXIMATE DISTRUBUTION OF PRINCIPAL MONTANA RODENTS

Columbian Ground Squirrel

Prairie Dog

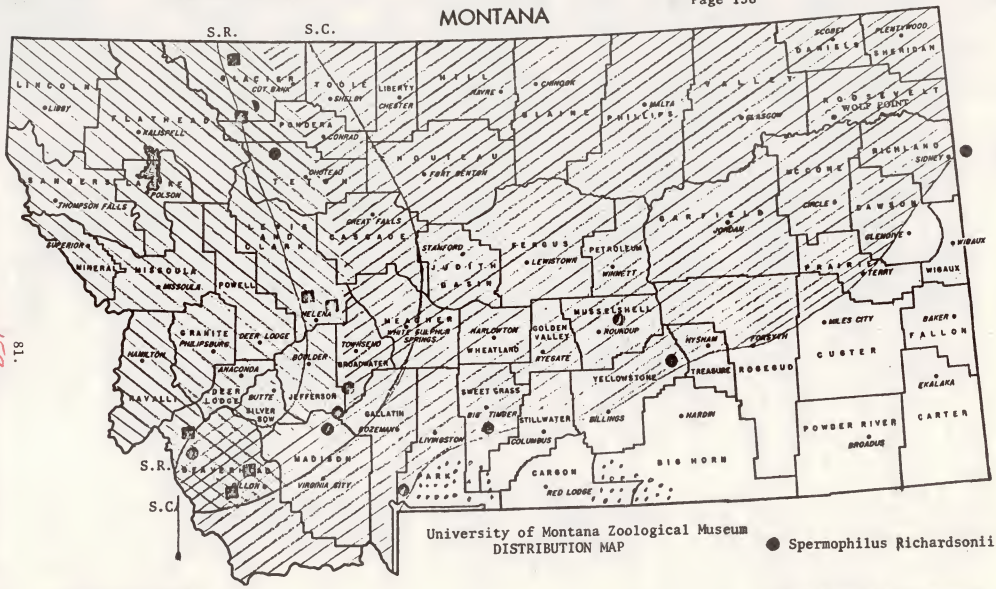
No. 1052 — County Outline Map
STATE PUBLISHING COMPANY
Helena



No. 1052 — County Outline Map
STATE PUBLISHING COMPANY
Helena

156 80.

Montana Cooperative Extension Service - Bulletin No. 151 - February 1937



University of Montana Zoological Museum
DISTRIBUTION MAP

● Spermophilus Richardsonii

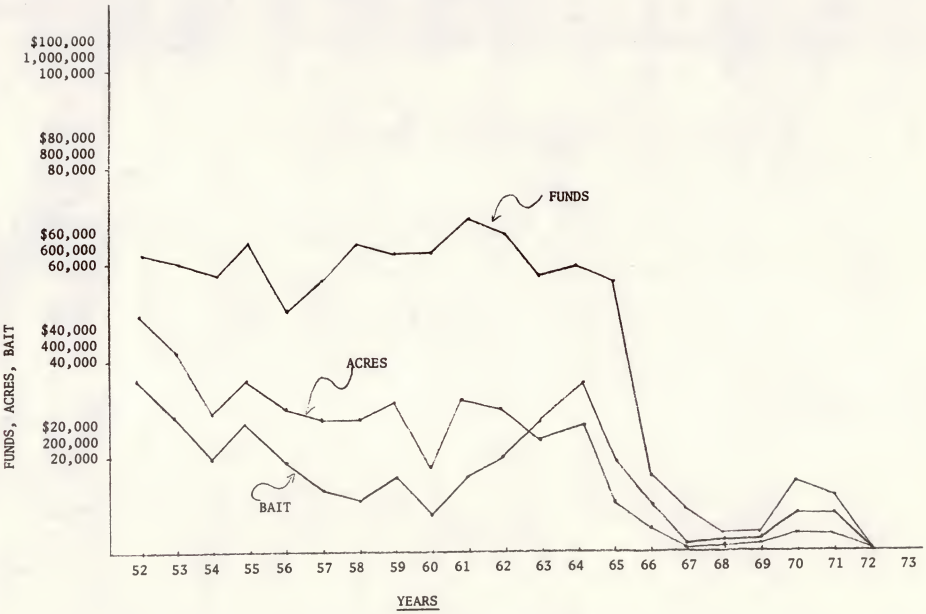
■ Spermophilus Columbianus

No. 1052 — County Outline Map
STATE PUBLISHING COMPANY
Helena

Finally the committee is enclosing various graphs depicting rodent control programs from fiscal year 1952 through fiscal year 1973. The graphs have been subdivided into supervised and non-supervised programs. The supervised program refers to programs under the specific control of the Bureau of Sports, Fisheries and Wildlife. Non-supervised refer to rodent control programs carried out by citizens utilizing Bureau baits.

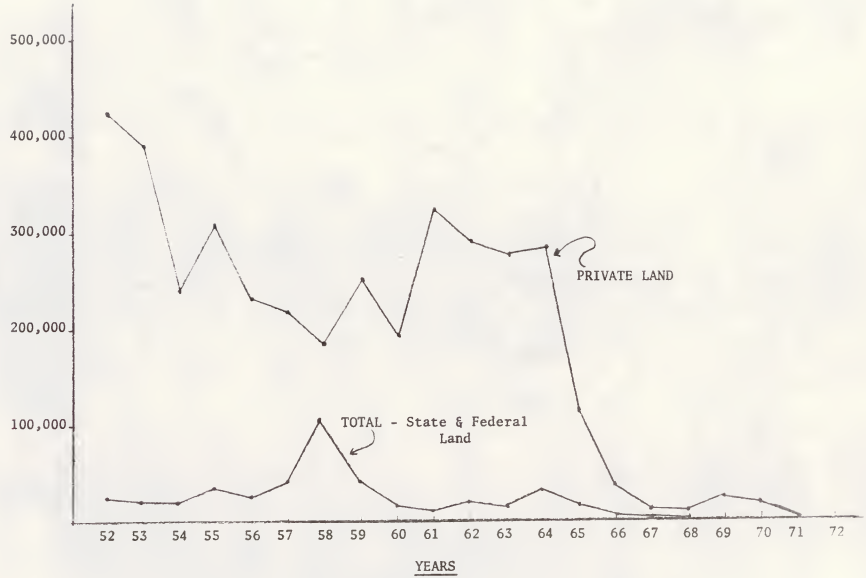
The graphs fairly well illustrate the history of rodent control since 1952 in Montana. Further explaination of these graphs will not be done in this report, but will be utilized and explained in detail in the councils final report to the Legislature and Governor.

SUPERVISED PROGRAM
(Funds, Acres, Bait)



83.

ACRES TREATED - SUPERVISED PROGRAM



MONTANA RODENT CONTROL

U.S. FISH AND WILDLIFE SERVICE

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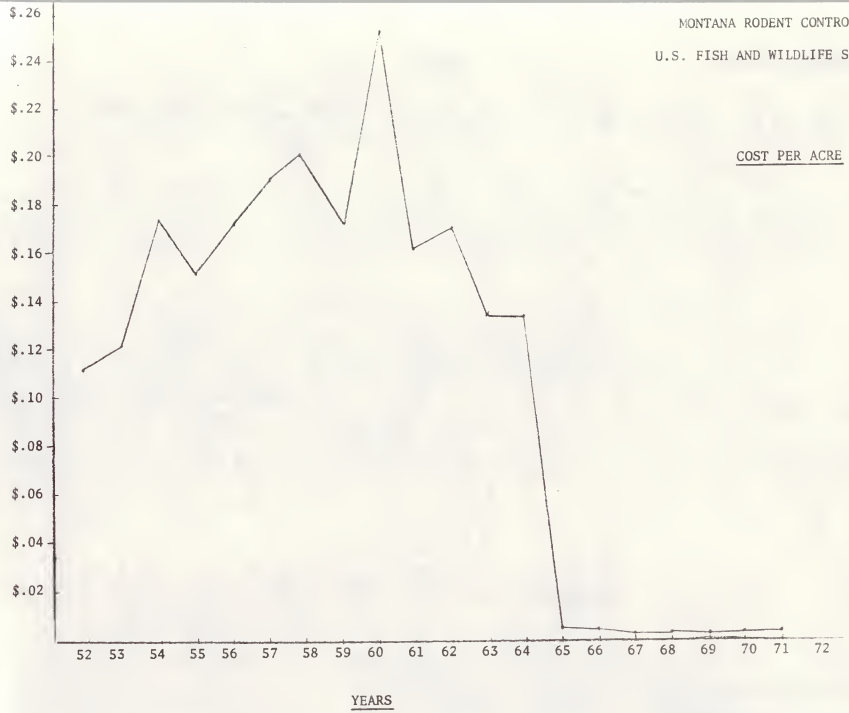
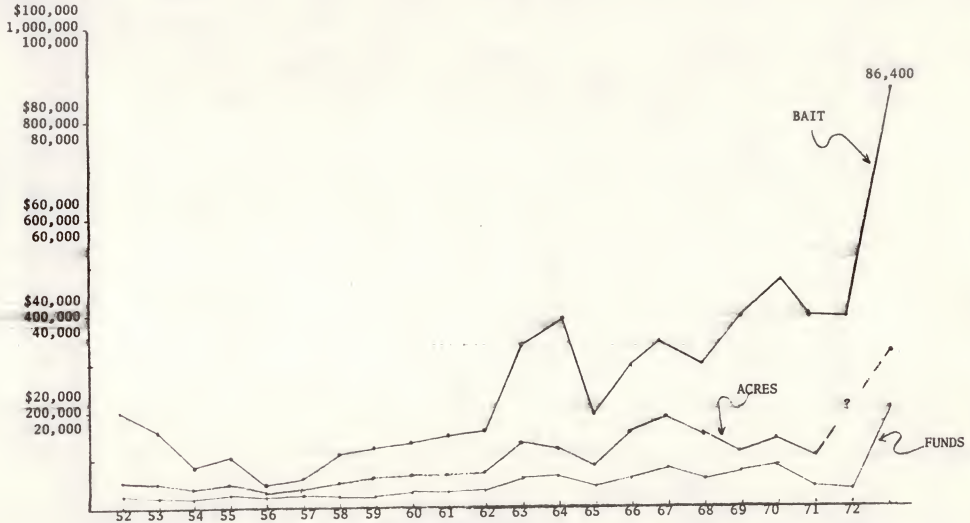
MONTANA RODENT CONTROL

U.S. FISH AND WILDLIFE SERVICE



NON-SUPERVISED PROGRAM

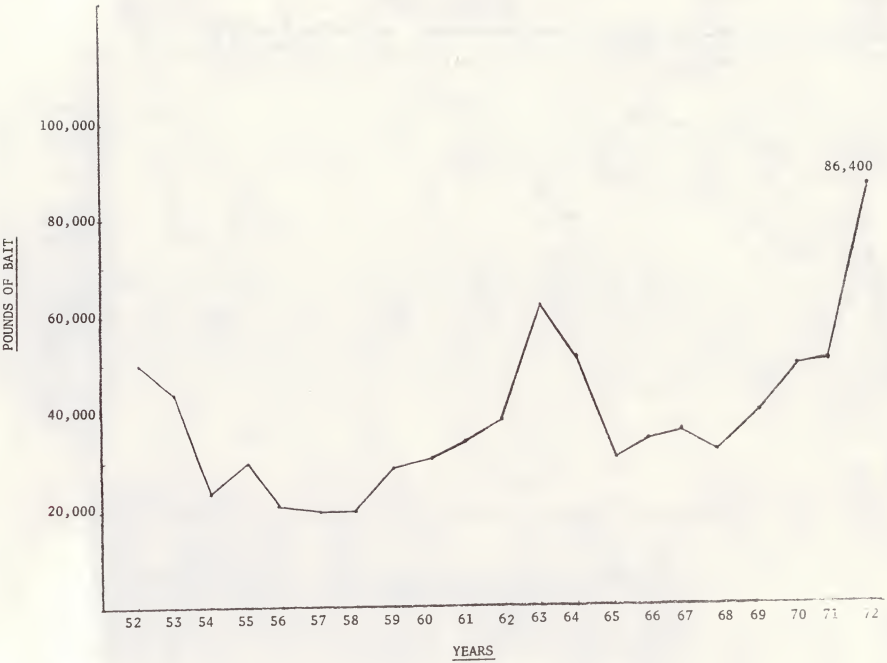


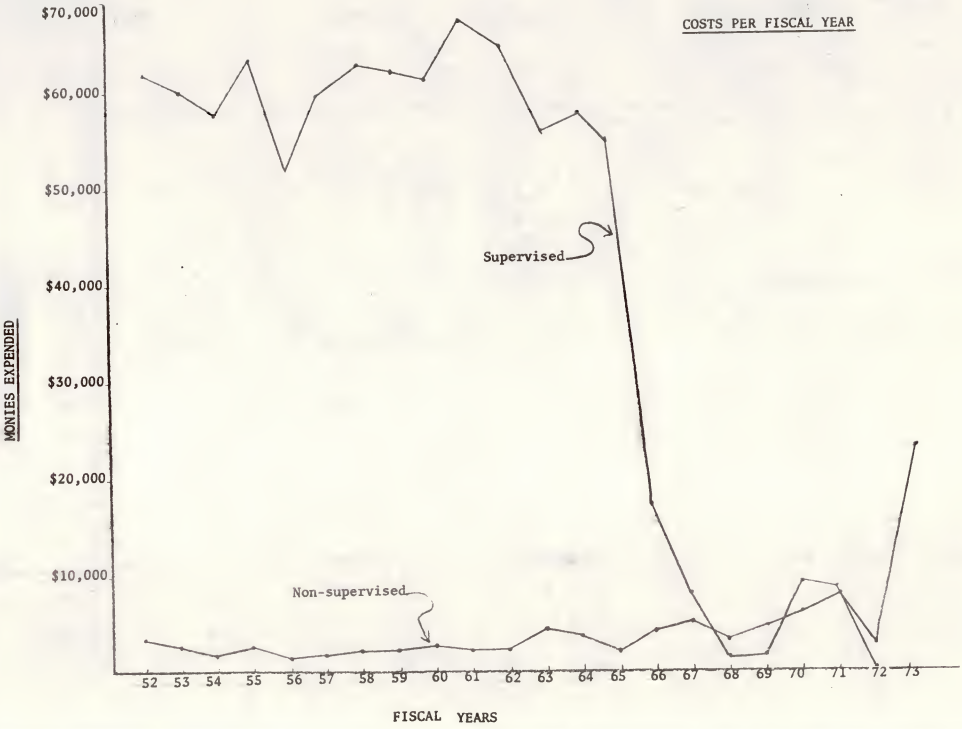
KEY: Funds
Acres
Pounds of Bait

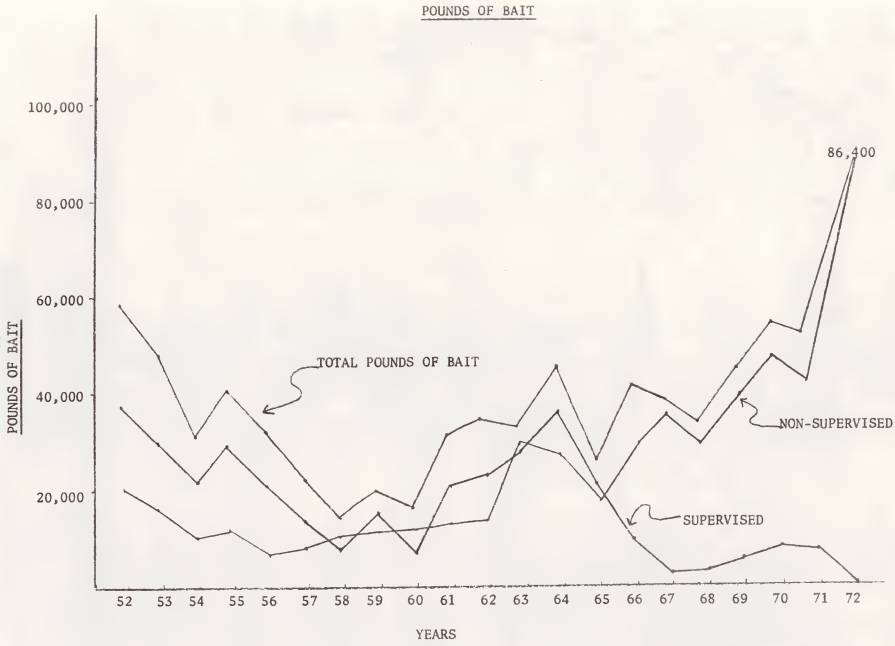
? - Acreage figure not available for 1972

87. 163

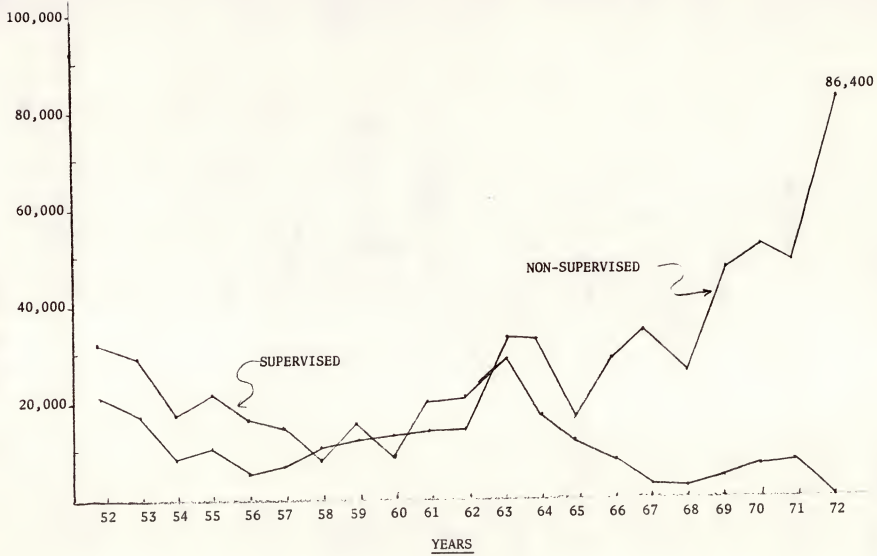
TOTAL POUNDS OF BAIT ON PRIVATE LANDS




COSTS PER FISCAL YEAR
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
MONIES EXPENDED
Supervised
Non-supervised
52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73
FISCAL YEARS


POUNDS OF BAIT
100,000
80,000
60,000
40,000
20,000
POUNDS OF BAIT
86,400
TOTAL POUNDS OF BAIT
NON-SUPERVISED
SUPERVISED
52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
YEARS

POUNDS OF BAIT ON PRIVATE LAND



91. 67

DOCUMENT #14

DEPARTMENT OF AGRICULTURE

Advisory Council

on

Rodents and Rabid Skunk Control

INTERIM REPORT

to

Governor Thomas L. Judge

and the

Montana Senate

and

House of Representatives

January 1973

DEPARTMENT OF AGRICULTURE

Advisory Council

on

Rodents and Rabid Skunk Control

INTERIM REPORT

Part I

Recommendations for the Establishment

of a Rodent Control Program in Montana

Part II

Recommendations on Rabid Skunk Control

Part III

Recommendations on Predator Research Funds

Part IV

Recommendations on the Establishment of an

Evaluation Program in Montana

STATE OF MONTANA
DEPARTMENT OF AGRICULTURE
GEORGE LACKMAN
COMMISSIONER
LAIRD STUDIES BUILDING
HELENA, MONTANA 59601

TELEPHONE
AREA CODE 406
449-

January 11, 1973

The Honorable Thomas L. Judge
and Members of the 43rd Legislature
State Capitol Building
Helena, Montana 59601

Dear Governor Judge and Members of the 43rd Legislature:

The Department's Advisory Council on Rodents and Rabid Skunk Control has spent considerable time and effort in formulating their recommendations on controlling and evaluating rodents, rabid skunks and predators in Montana. I urge your approval of the council's proposed resolutions on rabies and predator control research and the proposed act to implement an evaluation program on rodents, rabid skunks and predators in Montana.

The council has established an acceptable rodent and rabies control program while providing for evaluation of the affects of such programs on Montana's environment. I encourage your approval of the proposed budget to support this evaluation program because of its importance to the state now and in the future.

If you should have any questions concerning this interim report, please feel free to contact the Department of Agriculture at your convenience.

Respectfully yours,

George Lackman

George Lackman
Commissioner of Agriculture

ADVISORY COUNCIL DIRECTIVE

The Department of Agriculture was instructed by Governor Anderson, April 25, 1972 to designate a council, equally representing four basic disciplines; agriculture, health, livestock and wildlife. This council was given the responsibility of developing appropriate legislation to provide for an organized program to control rodents affecting our food supplies and rabid skunks endangering the health of our citizens and livestock, while insuring that our environment is protected from possible adverse affects of pesticides.

This council report is hereby respectfully submitted by the members of the Advisory Council to the Honorable Thomas L. Judge, Governor of Montana and to the members of the 43rd Legislature for their consideration and possible actions.

COUNCIL MEMBERSHIP

NAME	TITLE	DISCIPLINE REPRESENTED
J. Frederick Bell, M.D., Ph.D	Medical Director Rocky Mountain Laboratory Public Health Service U.S.D.H.E.W.	Health
Wm. G. Cheney	Administrator Brands-Enforcement Division Department of Livestock	Livestock
Robert L. Eng. Ph.D.	Professor of Zoology Montana State Universtiy	Wildlife
Gary L. Gingery*	Administrator Pesticide Division Department of Agriculture	Agriculture
Bill C. Hicks	Rancher - LY Ranch	Livestock
Peter Jackson	Agriculturalist & Range Management Specialist Department of Natural Resources and Conservation	Agriculture
Thomas W. Mussehl	Chief of Research Section Department of Fish and Game	Wildlife
Vernon E. Sloulin	Bureau Chief Environmental Services Department of Health and Environmental Sciences	Health

*Chairman

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PART II

RECOMMENDATION ON RABID SKUNK CONTROL IN MONTANA

PART III

RECOMMENDATIONS ON PREDATOR RESEARCH FUNDS

PART IV

RECOMMENDATION ON THE ESTABLISHMENT OF AN EVALUATION PROGRAM IN MONTANA

DEFINITIONS

"APPLICATOR": as defined in the Montana Pesticides Act, is any person who applies pesticides by any method. The act also defines "commercial applicators" and "farm applicators".

"BUREAU": the Bureau of Sports Fisheries and Wildlife, U.S. Department of Interior.

"CONTROL": a coordinated operation of effectively reducing an animal population in areas where the population is of economic importance or of public health concern.

"COOPERATORS": any person, bureau, or agency that cooperates in a rodent, rabid skunk or predator control or evaluation program.

"COUNCIL": the Department of Agriculture's Advisory Council on Rodents and Rabid Skunks, composed of 8 members, representing equally agriculture, health, livestock and wildlife interests.

"DEALER": as defined in the Montana Pesticides Act, is any person who sells, wholesales, offers, or exposes for sale, exchanges, barters or gives away within this state any pesticides, except those pesticides which are to be used for home, yard, garden, home orchard, shade trees, ornamental trees, bushes and lawns.

"DEPREDATION": to plunder or ravage.

"EVALUATION": scientific method of obtaining information on the biology of rodents, rabid skunks and predators, determining their economic and public health affects and effects of controlling these animals on the environment.

"PREDATION": a mode of life in which food is primarily obtained by killing and consuming animals.

"PREDATOR": an animal that lives by predation.

"RESTRICTED USE PESTICIDES": as defined by the Montana Pesticides Act, means any pesticide, including highly toxic pesticides, which the Department

of Agriculture has found and determined, subsequent to a hearing, to be injurious when used in accordance with registration, label, directions and cautions to persons, beneficial insects, animals, crops or the environment other than the pests it is intended to prevent, destroy, control or mitigate.

"RODENT": any of an order (Rodentia) of relatively small gnawing mammals having a single pair of upper incisors with a chisel shapped edge; also a lagomorph (as a rabbit) or other small mammal (as a shrew).

"RODENTICIDE": as defined by the Montana Pesticide Act, means any substance or mixture of substances intended for preventing, destroying, repelling or mitigating rodents or any other vertebrate animal.

"STATE SUPERVISOR": refers to the Bureau of Sports Fisheries and Wildlife personnel, who administers the predator, rodent and rabid skunk control programs in Montana.

Interim Report

of the

Department of Agriculture's Advisory Council

on

Rodents and Rabid Skunks

Introduction

These recommendations by the Department of Agriculture's Advisory Council on Rodent and Rabid Skunk control are a result of the President's Executive Order in February 1972. This order forced the Bureau of Sports Fisheries and Wildlife to stop controlling predators with toxicants and also forced the closure of the Bureau's Bait Mixing Stations in the United States. Thus, Montanan's could not obtain rodent baits in 1972 from the Bureau's depot in Pocatello, Idaho. This depot has now been reopened and may distribute rodent baits subject to various guidelines established by the Bureau.

Following a meeting called by Governor Anderson in April,1972, it was decided that the State should immediately implement two programs for rodent control. The first program was temporary in that the Department's of Agriculture and Livestock were directed by the Governor to find a source for baits in 1972 and establish a distribution system for the bait to all the counties. There were several specific problems connected with this program; the delayed delivery of the bait, and the low strength of the bait in terms of the percentage of active ingredient of strychnine.

The second action established an Advisory Council within the Department of Agriculture, equally representing agriculture, health, livestock and wildlife. This 8 member Council has held numerous meetings on rodents, rabid skunks and predator control. Materials on these three subjects have been

collected from other states and various federal agencies. Speakers knowledgeable in the various areas of concern have presented information on many different aspects of controlling rodents, rabid skunks and predators.

Following are the Advisory Council recommendations for enacting a comprehensive rodent control program and a rabies program in Montana and our recommendations on predator research. (There will, eventually, be a complete report of the Council's actions and activities; however, due to lack of time, the council is setting forth these recommendations now for review by appropriate legislative committees.)

Montana has never adequately evaluated its rodent-predator problems, but instead has proceeded with control programs involving toxicants. Therefore, even though the State has carried out programs since the early 1900's, definitive data are not available on the; distribution of economically significant species, (pocket gopher, Columbian and Richardson ground squirrels, prairie dogs, meadow mice, rabid skunks and coyotes), relative population densities throughout the years, effects of land use practices on population, degrees of economic damage experienced, evaluation of potential public health affects, areas in which control should or should not be carried out, methods and procedures of control and the necessity or usefulness of control.

The Advisory Council believes it is imperative that these factors be investigated and evaluated if these species are to be controlled rationally with toxicants or other control techniques. The Council's recommendations will emphasize the need for continuous evaluation as an essential part of any program.

PART I

Recommendations for the Establishment

of a Rodent Control Program

in Montana

I. Recent Department of Interior Actions

A.) Introduction

The Bureau's rodent bait depot has been reopened for distribution of baits in 1973. The formulation and distribution of the baits is subject to the following guidelines established in the Department of Interior's Memorandums of May 27, August 25 and November 30, 1972.

B.) Pertinent Memorandums and Regulations

(1) Use of Rodenticides

Secretary Morton's memorandum of May 26 sets forth the following guidelines on the Bureau of Sports Fisheries and Wildlife use of rodent baits. Secretary Morton stated, "These guidelines allow the use of strychnine and zinc phosphide baits for controlling non-predatory mammals such as rodents and ground squirrels if there is only a remote chance of 'secondary poisoning effects'. It also allows use of Avitrol 200 and Starlicide for bird control and several fumigants and suffocating cartridges for burrowing animals". The Department of Interior will utilize only those chemicals and patterns of use registered with the Environmental Protection Agency.

The executive order defined a "secondary poisoning effect" as a poisoning occurring "when a chemical toxicant is retained in

a target animal in such a manner and quantity that its chemical action will cause significant bodily malfunction, injury, illness or death to non-target animals or to man when the body part retaining the chemical in question is ingested." Based upon this interpretation, the Department of Interior has stated that, "toxicants which have a theoretical secondary poisoning effect may be used if, in practical application, toxic concentration, bait materials, and methods of application are so controlled as to prevent adverse secondary effects to man and non-target populations."

This memo also stated that the agency directors (Bureau of Sports Fisheries and Wildlife) must give due consideration to the ecological knowledge of specific habitats and possible effects on carrion feeders present in the area, prior to use of the compounds in any area. The bait use and distribution must also meet all Federal and State pesticide use regulations.

(2) Toxicants Permitted for Non-Predatory Mammal and Bird Control

(a) Secretary Morton's memorandum continued: "Non-predatory mammal control baits -- baits treated with strychnine alkaloid or zinc phosphide may be used for controlling non-predatory mammal damage. Potential for secondary poisoning effects from normal uses of these toxicants are related to remnant amounts of the toxicant not degraded in the gastro-intestinal tract prior to death of the target individual and are not associated with other body parts. Since baits are treated at the lowest concentration effective against target animals, the possibility of 'secondary poisoning effects' occurring under field conditions is remote. However, if there is reasonable doubt as to secondary poisoning hazard, use will not be made."

(b) ..... (concerns the control of birds)

(c) "Burrow fumigants -- These fumigants include cyanide compounds, carbon bisulfide, methy bromide, and chloropicrin. These chemicals are generally considered to have no secondary poisoning effects and since use is restricted to underground situations, likelihood of contact with carrion feeders is remote." /The Advisory Council would like to note that, non-target residents of burrows (e.g. owls, ferrets) may be destroyed./

(d) "Suffocating cartridges -- These devices, when ignited and inserted into closed burrows, remove available oxygen and result in suffocation of target species. Secondary poisoning effects are not possible under these consitions." (The Advisory Council notes again that non-target residents in burrows may be killed.)

Finally the executive order refers only to "field use" of chemical toxicants. " 'Field use' applies only to controlling damage caused by non-commensal mammals, birds, and reptiles. The order does not apply to urban bird and rodent control programs for residential, industrial, and urban facilities, including garbage dumps, communication facilities, etc.; the order does not restrict the type of chemical toxicants that can be used in these situations."

C.) Manufacture and Distribution of Baits

The Bureau Memorandum of August 29 from the Portland Regional Supervisor to the Bureau's State Supervisors establishes guidelines for the operation of Pocatello Bait Mixing Plant. These guidelines are based upon Secretary Morton's Memorandum of May 23. Prior to distribution of any Bureau Baits within a state, a written agreement is required between the appropriate State agency or agencies and the Bureau.

The Bureau Regional Directors must designate those states that may participate in the distribution of Bureau baits to cooperators. (The state of Montana will have to present a plan to the Regional Supervisor on the distribution and control of rodent baits in Montana.)

Private cooperators to obtain Bureau baits, must request, on a form provided by Bureau, the Bureau's State Supervisor for his approval prior to the sale of any bait. The information on the form includes the following:

- type of bait
- amount of bait
- species to be controlled
- type of damage
- name of cooperator
- size of area treated
- specific location

Cooperators must also agree to apply the material only in accordance with procedures authorized by the Bureau of Sports Fisheries and Wildlife. A copy of the Bureau's form may be found on page 13.

On page 14 is the Bureau's list of recommended toxicants for rodents, baits available from the Pocatello depot, their cost per hundred weight and a list of registered commercial rodent baits in Montana.

D.) Supervision

The Bureau's Memorandum of November 30 from the Director to Regional Directors establishes additional guidelines on the sale and distribution of toxic grain baits. This memorandum stated that, "Responsibility for training and decisions on use of grain bait by private operators cannot be delegated to non-Bureau people. County extension agents or agricultural commissioners cannot be given this

authority. However, they can forward bait request agreements from individuals to State Supervisors, Division of Wildlife Services, who can in turn advise to whom bait can be released as indicated in the guidelines. A supply of bait, based upon anticipated requests may be sent immediately to the appropriate county official for release only upon approval of the State Supervisor."

An additional Bureau guideline pertains to the relationship between prairie dogs and the black-footed ferret, Mustela nigripes. This ferret is an endangered species as defined by the Department of Interior under Section 1 (c) of the Endangered Species Preservation Act of Oct. 15, 1966, /80 Stat. 926; 16 U.S.C. 16 aa(3)/.

Prior to implementation of a prairie dog control program utilizing Bureau baits, Bureau personnel must investigate the area for any sign. If the ferret is present control programs will not be carried out. The Council recommends that the Departments of Livestock and Fish and Game be notified as to the results of each Bureau investigation.

II. Recommended State Actions on Rodent Control

A.) Registration of Baits

The Montana Pesticides Act requires registration, with the Department of Agriculture, of all pesticides sold and used in the State. All Bureau and commercial rodent baits must therefore be registered prior to distribution in the State. Registration is not difficult to obtain because, Montana must accept for registration all pesticide products registered with the Environmental Protection Agency (Montana Pesticides Act, Section 27-217, (1)(b) R.C.M., 1947). Several commercial firms have registered their products as will the Bureau in the near future.

Rodenticides formulated for intrastate sale or distribution are

required to meet requirements of the Montana Pesticides Act. Intrastate registration requires review and approval by the Departments of Agriculture, Fish and Game, and Health and Environmental Sciences. If the product to be registered has environmental significance, an environmental impact statement must be prepared.

B.) Department of Livestock Responsibilities

The Department of Livestock is authorized by Title 3, Chapter 27, section 3-2701 R.C.M.,1947, "Control of Noxious Rodent Pests" to cooperate and enter into written agreements with the U.S. Department of Interior, in the control of rodents and related animals in the state that are injurious to agriculture, industry and public health.

Therefore, the Advisory Council recommends that the Department of Livestock enter into an agreement with the Bureau of Sports Fisheries and Wildlife immediately in order that Montana can participate in the distribution of Bureau baits in 1973. The Council also recommends that a program plan be submitted immediately to the Bureau's Regional Director for approval as required under the Department of Interior's guidelines.

C.) Restriction of Rodent Baits

The Advisory Council recommends that the distribution and use of strychnine and zinc phosphide rodenticides be restricted to provide for protection of the environment and human health and to allow for the development of pertinent information on rodents and their control. This restriction would allow individuals to control rodents affecting them economically, while assisting the state in developing adequate records on rodents and their control.

This proposed restriction could be accomplished in the following manner:

The Department of Agriculture under the authority of the Montana

Pesticides Act, Section 27-217, (1) (b) R.C.M., 1947, is allowed to restrict pesticides, by type of applicator, time and place of use and application. To accomplish restriction public hearings are required under this Act.

The Council recommends that all Bureau and commercial strychnine and zinc phosphide baits for rodent control be restricted. Restriction would require prospective cooperators to obtain a permit, without a fee, prior to purchasing any bait. The permit (example on page 15) would be issued upon certification that the individual has been informed in the following areas;

1.) species identification, biology and control
2.) proper use and handling of the toxicants
3.) safety precautions
4.) potential for non-target and secondary poisonings in other animals.

The Advisory Council believes that restriction should not create unreasonable hardship on cooperators, therefore, we recommend that the permits be issued through county and state offices for the Department of Agriculture.

To accomplish certification this first year, the Advisory Council recommends that a brochure on rodents and their control be prepared in cooperation with Montana Extension Service. The individual user would certify to the local official that he has read and understands the materials within the brochure prior to obtaining a permit. In succeeding years, besides utilizing the brochure, the Council recommends that the Department of Agriculture, in cooperation with other agencies, initiate training courses to provide for continued improvement of applicators handling rodent baits.

Prior to sale, a permit would have to be displayed to the pesticide

dealer and a pre sale form completed (example on page 16). However, unlike the Bureau's requirement of approving the request for purchase, the Department of Agriculture would not require approval prior to purchase. The purchase form would be submitted to the Department of Agriculture, who would in turn submit it to the Department of Livestock or to the Evaluation Team as proposed in this Interim Report. This would aid the development of an adequate record keeping system on rodents and their control in Montana. Possibly dealers should be required to maintain a record of rodent baits received and sold.

The Advisory Council recommends that commercial baits for prairie dog control also be restricted because of the endangered species, the black-footed ferret. This restriction would prevent the use of commercial bait for prairie dog control. The Council believes that the Bureau's bait for prairie dogs is more effective and that by utilizing only Bureau baits for prairie dogs, with the guidelines for protecting the black-footed ferret, that a more acceptable environmental program can be maintained.

These restrictions still allow cooperators to control rodents of economic or public health importance, while providing to the State a procedure for documenting information on rodents and their control. The Council believes that it is paramount to obtain more relevant information on rodents and their control, because of difficulty the Council had in obtaining meaningful data.

The training proposed for future years, carried out in conjunction with federal and state agencies, will, it is hoped, improve methods of controlling rodents and use of baits.

D.) Summary of Program Operation

- All pesticides must be registered with the Department of Agriculture

- The Department of Livestock should prepare a rodent control plan to be approved by the Regional Director of the Bureau of Sports Fisheries and Wildlife.
- The Department of Livestock should enter into an agreement with the State Supervisor, Bureau of Sports Fisheries and Wildlife prior to distribution of the Bureau's bait within the State.
- Strychnine and zinc phosphide rodent baits should be restricted by the Department of Agriculture.
- Restriction would involve the issuance of a Department of Agriculture permit to allow individuals to purchase Bureau and commercial baits. The permit should be issued on the local level (county and state offices) after the cooperator has certified that he understands the items listed in II. C, page 9.
- A brochure should be prepared by the Departments of Livestock, Agriculture, Health, Fish and Game, the Extension Service and the Bureau, which will assist cooperators to prepare for the permit certification.
- The Council recommends that training sessions be initiated in 1974 to assist cooperators in becoming more knowledgeable on the control of rodents.
- Individuals desiring to use Bureau or commercial baits would be required to display their permit to the pesticide dealer and complete a purchasing form. The Bureau's and the State's purchase form should be compatible to establish a standardized reporting system. The Bureau's form for purchasing Bureau's bait would be submitted to the State Supervisor, Division of Wildlife Services for review and possible approval prior to cooperator purchase. The Department of Agriculture's form for purchase of

baits would be submitted to the Pesticides Control Division, who would forward it to the Department of Livestock or to the Evaluation Team for record keeping. The Department of Agriculture would not be required to approve the purchase form prior to individual purchases.

- Commercial baits may be sold by any licensed pesticide dealer in Montana. Dealers should be required to maintain records.
- Bureau baits may be sold through local governmental personnel, licensed as pesticide dealers. Counties may stockpile the bait, with Bureau approval; however, sales to any individuals are prohibited until approved by the Bureau.
- The Bureau must review all proposed prairie dog control programs prior to implementation; to determine if the black-footed ferret is present. The Council recommends that the Departments of Livestock and Fish and Game be notified as to the results of each Bureau investigation.
- A summary of each years operation would be compiled from information received on the purchase forms. This information should be sent to appropriate state agencies for review, comment and possible reevaluation of the total rodent program.

AGREEMENT AND REQUEST FOR ANIMAL DAMAGE CONTROL BAIT

County:_____

The Bureau of Sport Fisheries and Wildlife is requested to supply_____ _____with chemical baits or other materials as listed below:

Name_____ Dealer_____

Address_____

_____ Permit No. _____

Check or fill in the columns

Type of Rodent	Type of Bait	No. Acres to be treated	Application Rate	lbs. of Bait requested
Columbian Ground Squirrel ( )				
Richardson Ground Squirrel ( )				
Prairie Dog ( )				
Field Mice ( )				
Pocket Gopher ( )				
Others (list name) ( )				
( )				
( )				

Method of Application: Hand ( ) Aerial ( ) Burrow Builder ( )

Approximate Period of Use: From_____ To_____

Legal Land Description: _____ _____ _____

Section Township Range

Bait to be used on: (Check the appropriate boxes)

federal land ( )	forage crops ( )	pasture land ( )	tree farm ( )
state land ( )	irrigated land ( )	range land ( )	crop land ( )
private land ( )	orchards ( )	reforestation ( )	

Specify crop(s)_____

Estimate dollars of economic loss_____

I have ( ) have not ( ) been instructed in the specific use of the requested bait described above and agree to apply the material only in accordance with procedures authorized by the Bureau of Sport Fisheries and Wildlife.

(ALL BLANKS ABOVE MUST BE COMPLETED BY APPLICANT)

Signed_____

ADMINISTRATION USE ONLY:

(Chemical baits will not be furnished until the user has received instructions on proper use of requested materials.)

BAIT SUPPLIED-TYPE_____ AMOUNT_____ DATE_____

APPROVED BY:_____

RECOMMENDED TOXICANTS FOR RODENTS

AND

BAITS AVAILABLE FROM THE POCATELLO DEPOT

TYPE OF RODENT	CONCENTRATION	TOXICANT	CARRIER
Columbian Ground Squirrel	.5% (1-10)	Strychnine	Oats
Richardson Ground Squirrel	.35% (1-16)	"	"
Pocket Gopher*	.5% (1-10)	"	"
Prairie Dog	.35% (1-16)	"	"
Meadow Mice	1% 1-lb./100 lbs. 2% 2-lb./100 lbs.	Zinc Phosphide " "	Oats, wheat " "

* The pocket gopher baits must be treated with rophlex to permit distribution with a burrowing building machine.

APPROXIMATE COSTS OF BUREAU BAITS

TOXICANTS*	10#	25#	50#
Strychnine (1-10)	$20.00	$19.00	$18.50
Strychnine (1-16)	15.00	14.00	13.75
Zinc Phosphide 1%	9.50	9.00	8.50
Zinc Phosphide 2%	11.00	10.50	10.00

* All prices listed per cwt.

AVAILABLE COMMERCIAL RODENT BAITS

Pocket Gopher	.31% (1-20)	Strychnine	Oats
Prairie Dog	.44% (1-14)	"	"
Richardson Ground Squirrel	"	"	"
Kangaroo Rat	"	"	"
Field Mice	" 1% 1-lb./100 lbs.	" Zinc Phosphide	" Oats, wheat

DEPARTMENT OF AGRICULTURE

Pesticides Control Division

Permit for Strychnine
and
Zinc Phosphide Rodenticides

I, _____, certify that I have read and/or have been instructed and am informed on the identification of rodents, proper use, handling and safety precautions of toxicants and realize the potential for non-target and secondary poisonings in other animals.

DATE_____ SIGNED_____

ADDRESS_____

_____

I certify that the bearer of this permit has met all obligations under the Montana Pesticides Act and is now allowed to purchase strychnine and zinc phosphide rodent baits in Montana.

SIGNATURE OF AUTHORIZED
DEPARTMENT OF AGRICULTURE
REPRESENTATIVE:

Permit No. _____

SIGNED_____

DATE_____

Return original permit to the Department of Agriculture. Applicant receives copy.

DEPARTMENT OF AGRICULTURE
Pesticides Control Division

Rodent Bait Purchase Form

NAME_____ COUNTY:_____

ADDRESS_____ DATE_____

_____ PERMIT NO. _____

DEALER_____

All Blanks Must Be Completed Prior To Purchase.

Check or fill in the columns

Type of Rodent		Type of Bait	No. Acres to be Treated	Application Rate	lbs. of Bait Requested
Columbian Ground Squirrel	( )				
Richardson Ground Squirrel	( )				
Prairie Dog	( )				
Field Mice	( )				
Pocket Gopher	( )				
Others (list name)	( )				
	( )				
	( )				

Method of Application: Hand ( ) Aerial ( ) Burrow Builder ( )
Approximate Period of Use: From _____ To _____

Legal Land Description: _____ _____ _____
Section Township Range

Bait to be used on: (Check the appropriate boxes)

federal land ( )	forage crops ( )	pasture land ( )	tree farm ( )
state land ( )	irrigated land ( )	range land ( )	crop land ( )
private land ( )	orchards ( )	reforestation ( )	

Specify crop(s)_____

Estimate dollars of economic loss_____

RETURN TO: Department of Agriculture, Pesticides Control Division
Mitchell Bldg. - Rm. 339, Helena, Montana 59601

PART II

RECOMMENDATIONS ON RABID SKUNK CONTROL

IN

MONTANA

I. Introduction

Occurrence of rabies in wildlife (mainly skunks) in Montana is an endemic problem. As is, the existence of the disease in our area is an integral part of the biotic communities. Although relatively few deaths have occurred from human rabies infections in the United States in the last few years, the disease has obvious social, economic and political impact on communities.

Since 1964, 69 animals have been found to have rabies in Montana: 43 (64%) were skunks, 16 (24%) were bats, 4 (6%) were cattle and 1 each (1½%) was a sheep, badger, cat and a dog. Since 1964, skunk rabies appears to have spread across 1/3 to 1/2 of Montana; however, this westward movement is extremely difficult to interpret in terms of its presumed movement.

Rabid Skunk Control programs have been carried out in the State throughout the 1960's and 1970's whenever positive rabid skunks were found. The purpose of these programs was to reduce the skunk population significantly in each area to prevent an epidemic or epizootic spread. Control generally involves the utilization of toxicants, traps and shooting to suppress local spreading within a three mile radius by breaking the chain of infection. These programs, while seeming to be

successful, left many questions unanswered because of inadequate evaluation and have resulted in varying opinions as to their effectiveness.

A.) Federal Action Affecting Rabid Skunk Control

The President's Executive Order (Feb. 8, 1972) "Environmental Safeguards on Activities for Animal Damage Control on Federal Lands" prevents the use of toxicants for skunk control. The reason for this is the skunk is classified as a predator and no toxicants are presently registered with the Environmental Protection Agency for predator control. With the removal of toxicants the Bureau of Sports Fisheries and Wildlife generally withdrew from any reduction program.

B.) State Actions and Recommendations on Rabid Skunk Control in Montana

The Montana Livestock Board on December 13, 1972 passed a new policy on rabid skunk control. This policy is set forth below:

> "Mr. Ted Saylor made a motion that the Department of Livestock abandon a predetermined skunk reduction program of a fixed area perimeter and using toxicants. The skunk reduction program shall be accomplished by trapping and shooting in an area whose perimeters shall be determined in relation to the location of a rabid skunk by the Department's Biologist. In the event that this program does not prove adequate to protect animals and man from undue exposure to rabies, then upon the determination of the State Veterinarian that a rabies emergency does exist, toxicants will be employed to effectuate the skunk reduction program in the area selected by the Biologist. The motion was seconded by Mr. Simons and carried unanimously."

In effect, this policy means that pursuant to a possible agreement between the Department of Livestock and the Bureau of Sports Fisheries and Wildlife, the Bureau will handle all skunk reduction programs in Montana. These programs will be carried out utilizing traps, shooting and denning, no toxicants will be used. Provided, that, if the State Health Officer and/or the State Veterinarian declare an emergency, toxicants can possible be utilized.

The Advisory Council endorses the Livestock Board's policy. The Council also recommends that the state of Montana should go on record for supporting a national research program for wildlife rabies. The Council believes it is essential to implement such a program immediately because wildlife rabies continues to be a threat. We would be very disappointed to see the development of piecemeal, short term or inadequate programs which would not truly commensurate or solve the problem. Scientific knowledge to combat the disease must be established in the near future in order to develop orderly, rational and effective programs for control of rabies in wildlife.

II. Resolution for "National Wildlife Rabies Research Program"

Therefore, the Advisory Council recommends that the Legislature adopt the following resolution to be sent to the United States Congress and the President.

_____ JOINT RESOLUTION NO. _____

INTRODUCED BY _____

A JOINT RESOLUTION OF THE SENATE AND HOUSE OF REPRESENTATIVES RESPECTFULLY REQUESTING THE CONGRESS AND THE PRESIDENT OF THESE UNITED STATES TO ESTABLISH A NATIONAL RABIES WILDLIFE RESEARCH PROGRAM TO PROVIDE PROTECTION TO THE CITIZENS OF MONTANA AND OTHER STATES.

WHEREAS, the state of Montana has experienced wildlife rabies for many years and expects to continue experiencing wildlife rabies in the future, and

WHEREAS, the exposure of Montana citizens directly to wildlife rabies subjects these individuals to a traumatic experience for fear for life and the ordeal of receiving anti-rabies inoculations, and

WHEREAS, communities experiencing wildlife rabies make demands to state and local governments for control measures which may or may not alleviate the problem, and

WHEREAS, wildlife rabies is transmissible to domestic livestock and results in economic losses, and

WHEREAS, when skunk rabies occurs, Montana has carried out selective skunk populations suppression programs, the results of these actions remain subject to many varying opinions and interpretations as to their effectiveness, and

WHEREAS, rabies in wildlife is a problem that involves several agencies of government, making it difficult to define primary responsibility, coordination and cooperation between agencies is necessary for adequate solution of the problem, and

WHEREAS, rabies in wildlife is a problem common to many of the contiguous states, Alaska, and Canada and respects no political or administrative boundaries, and

WHEREAS, the Department of Agriculture's Advisory Council on Rodents and Rabid Skunks having made a comprehensive review of rabies in wildlife find that more research is needed to obtain information to protect man and livestock from wildlife rabies:

1.) More information is needed on the epidemiology of wildlife rabies.

2.) More information is needed on the ecology of vector species having a high incidence of rabies.

3.) More effective, ecologically sound control measures must be developed.

4.) Finally, the council recommended that such studies should be initiated and coordinated by the federal government to provide for a standardized rational rabies control program.

NOW, THEREFORE, BE IT RESOLVED BY THE SENATE AND HOUSE OF REPRESENTATIVES OF THE STATE OF MONTANA:

That Montana, respectfully, requests the Congress and President of the United States to provide the necessary manpower and funds to implement a national research effort on rabies and its control in wildlife, and

BE IT FURTHER RESOLVED, that Montana is desirous of establishing animal control programs, based upon scientific findings, which do not adversely affect our environment, but provide the methods to protect man and livestock from wildlife rabies, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent by the Secretary of State of Montana to the United States Congress through Montana's appropriate delegates and to the President of the United States, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent to the Governor for his review and possible use in establishing programs to protect and assist the citizens of Montana, and

BE IT FURTHER RESOLVED, that the Governor at his discretion may forward this resolution to other states for their review, to establish and coordinate similar programs among states to achieve the purpose of this resolution.

PART III

RECOMMENDATIONS ON PREDATOR RESEARCH

I. Introduction

The Advisory Council was not specifically directed to review predator control in Montana. However, because the three programs; predators, rodents and rabid skunks are inseparable and intimately associated, the Council did review this problem to some degree. Without going into the extreme controversy surrounding predator control today, we make the following recommendation:

The Advisory Council believes that basic research is necessary to understand predation, and that until this research is expanded the controversy will continue. Again, we would urge the Legislature to consider and pass the resolution presented in an attempt to release the predator research funds already appropriated by Congress, which would make it possible to develop solutions to pressing problems in this field.

II. Resolution on Releasing Predator Control Research Funds:

_____JOINT RESOLUTION NO. _____

INTRODUCED BY _____

A JOINT RESOLUTION OF THE SENATE AND HOUSE OF REPRESENTATIVES RESPECTFULLY REQUESTING THE PRESIDENT AND THE CONGRESS OF THESE UNITED STATES TO MAKE AVAILABLE THE FIVE HUNDRED THOUSAND DOLLARS ($500,000) OF PREDATOR CONTROL RESEARCH FUNDS APPROPRIATED BY THE 92ND CONGRESS.

WHEREAS, the livestock industry of the state of Montana is an essential industry that provides meaningful monies and employment to Montana's, and

WHEREAS, the livestock industry is affected adversely by coyote depredation and other factors such as disease, weather and prices, and

WHEREAS, depredation is extremely difficult to control, and

WHEREAS, Montana is committed to the preservation of our environment for future generations, and to prevention of depredation with minimal adverse affect upon the environment, and

WHEREAS, with the present lack of sufficient knowledge the control of predators remains extremely controversial, which makes solutions difficult to obtain, and

WHEREAS, the State's Advisory Council on Rodents and Rabid Skunks having reviewed the predator problem recommends, and the legislature concurs, that the most reasonable approach to this difficult problem is to carry out basic research on predators on the national level.

NOW, THEREFORE, BE IT RESOLVED BY THE SENATE AND HOUSE OF REPRESENTATIVES OF THE STATE OF MONTANA:

That Montana, respectfully, requests the President to release the $500,000 of Predator Control research funds appropriated by the 92nd Congress, and

BE IT FURTHER RESOLVED, that Montana requests Congress to support this resolution and continue to support basic research on predators directed at resolving environmental and economic considerations, and

BE IT FURTHER RESOLVED, that Montana recommends that these research funds be utilized in establishing methods for determining and evaluating:

1.) Predator-Prey Population Dynamics

2.) Predator-Prey Relationships

3.) Predator Damage Assessments

4.) Depredation Control

5.) Related Social Economic data, and

6.) Management Practices of Livestock Industries, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent by the Secretary of State of Montana to the President of these United States and to the Congress through Montana's appropriate delegates, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent to the Governor for his review and support, and

BE IT FURTHER RESOLVED, that the Governor may use this resolution to enlist the support of other states for the release of the research funds, appropriated by the 92nd Congress.

PART IV

ESTABLISHMENT OF AN EVALUATION PROGRAM

IN

MONTANA

I. Introduction

The Advisory Council believes the establishment of an evaluation program on rodents, rabid skunks and predators is of the utmost importance to Montana. The Council having reviewed considerable information and data in these areas feels that without more concrete data, speculations controversy and dissensions among ourselves and the citizens of the state will continue as to the need, environmental significance and success of any control program.

Information available from the Bureau, the Department of Livestock and through a Council survey of counties, illustrates the nearly complete absence of evaluation in past control programs. Adequate understanding of rodents and rodent damages in various sections of state is lacking in many cases, effects of control programs for rodents and predators are unknown, areas in which control must not be initiated because of significant environmental or human health considerations are conjectural, actual economic damages experienced have almost never been documented, a system for determining when and where control should be utilized has not been developed.

Therefore, it is our conclusion that an evaluation program must be implemented now, to prepare for the future. Evaluation will provide a system of control, that is based upon sound scientific and economic facts rather than upon speculations and misunderstanding among the parties involved.

II. Recommended Legislative Action to Create an Evaluation Program

The Advisory Council recommends that the following legislative draft be considered and passed by the 43rd legislature:

_____ BILL NO. _____

INTRODUCED BY _____

A BILL FOR AN ACT ENTITLED: "AN ACT CREATING A STATE RODENT, RABID SKUNK AND PREDATOR EVALUATION PROGRAM IN THE DEPARTMENT OF LIVESTOCK TO INVESTIGATE, REVIEW AND EVALUATE RODENTS AND PREDATORS OF ECONOMIC AND PUBLIC HEALTH CONCERN AND TO RECOMMEND METHODS OF EFFECTIVE CONTROL HAVING THE LEAST ADVERSE EFFECT ON MONTANA'S ENVIRONMENT."

BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF THE STATE OF MONTANA:

Section 1. Declaration of Purpose: The state of Montana, especially its agricultural and livestock industries, continues to experience economic damages from rodents and predators and citizens continue to be exposed to wildlife rabies. The state while experiencing these problems and carrying out control programs, has limited knowledge on the distribution, population levels, actual economic damages, and ecology of the various species involved. Without a thorough understanding of these factors and others, the state cannot adequately justify control programs and the present techniques of control. Therefore, it is deemed necessary and proper to investigate, review and evaluate rodents and predators of economic and public health significance in order to establish rational and effective recommendations for control, while protecting our environment.

Section 2. Rodent and Predator Evaluation Programs: There is created a state rodent and predator evaluation program within the department of livestock. The department of livestock is hereby instructed to employ a team of specialists, contingent upon legislative appropriations, to accomplish the evaluation objectives set forth in Section 3 of this act. The evaluation program will involve only those animal species of economic or public health

significance. Primarily the Columbian and Richardson ground squirrels, pocket gophers, prairie dogs, meadow mice, rats, skunks, coyotes and other rodent or predator species of economic or public health significance, as determined by the evaluation team.

Section 3. Powers and Duties:

(1) The department of livestock is hereby instructed, through its evaluation team specialists to investigate, review, evaluate and report their findings on the subjects set forth within this Section. These evaluations shall be accomplished only in regard to the species set forth in Section 2:

(a) determine the distribution of rodents in Montana;

(b) determine relative population densities of rodents and predators in the various ecosystems of the state;

(c) determine the relationship between land use and rodent-predator problems;

(d) determine the types and degree of socio-economic damage experienced;

(e) recommend the type of controls that may be utilized in the various ecosystems per species within the state;

(f) determine where control is not necessary or where controls should not be implemented because of significant human health and/or environmental concerns;

(g) evaluate the effectiveness of chemical and non-chemical control methods and programs;

(h) determine whether potential and/or actual non-target and secondary species are being affected by the use of toxicants or other control techniques;

(i) all evaluations must include three broad concerns; economic losses, public health and protection of Montana's environment;

(j) the evaluation team shall not become directly involved with any control program in the state, because of the potential of changing program priorities from evaluation to control;

(k) the evaluation team is hereby directed to prepare an annual report of its activities, evaluations and findings to the Governor, legislature and appropriate state agencies, besides preparing information for the Governor's annual report;

(l) the evaluation team is directed to establish cooperative programs with any local, state or federal agency that can assist in the evaluation program or increase the effectiveness of the team;

(m) the team is directed to explore sources of private, state and federal funds to carry out research in these areas.

Section 4. Personnel and Qualifications:

The personnel to be employed shall have the following qualifications;

"Team Leader" - PhD. or a M.S. degree with five (5) years experience in one of the biological sciences.

Assistant Biologists - M.S. degree or B.S. degree in one of the biological sciences.

The legislature directs the department of livestock in so far as possible, to employ an interdisciplinary team of individuals, knowledgeable in the following areas; environment, ecology, mammalogy, range and agricultural management practices and other scientifically related fields.

Section 5. Advisory Council

The department of livestock shall appoint an advisory council the first two years that this act is in effect. In subsequent years, the department may appoint advisory councils as needed. The advisory council, not to exceed five (5) members, shall represent the disciplines; agriculture, health, livestock and wildlife. One member shall be appointed at large.

The advisory council may assist the director of the department of livestock in;

- formulating evaluation team policy
- employing qualified personnel
- establishing program objectives and priorities
- reviewing results of the evaluation team
- providing any other assistance requested.

Section 6. Effective Date.

This act shall become effective July 1, 1973.

III. Evaluation Program Costs

The cost of the program for fiscal years 1974 and 75 is set forth in the following illustrations:

	F.Y. '74		F.Y. '75
Personnel Services			
Salaries			
Team Leader	$12,000		$12,600
Ass't Biologist (2) ($8,500-$10,000)	18,000		18,990
Secretary	5,040		5,292
Benefits	4,219		4,434
SUBTOTAL	$39,259		$41,316
Operating Expenses			
Contracted Services	1,000		1,000
Supplies & Materials	3,621		2,000
Communication& Transportation	2,840		2,840
Travel	14,580		14,580
Rent	200		200
Repair & Maintenance	150		150
Other Expenses	150		150
Equipment & Livestock	3,200		2,764
SUBTOTAL	$25,541	SUBTOTAL	$23,684
TOTAL BUDGET	$65,000		$65,000

IV. Summary

To accomplish the program objectives the Council feels that the program should continue for at least 10 years. It will, most likely, take that amount of time for the team to evaluate all of these objectives and to set forth scientific findings and recommendations.

Finally, the Council would like to reiterate that the teams purpose is to evaluate rodent and predator populations and their effects, control programs, and to make operational improvements, but not to become directly involved in any control program, especially crash programs.

DOCUMENT #15

SENATE JOINT RESOLUTION NO. 25

A JOINT RESOLUTION OF THE SENATE AND THE HOUSE OF REPRESENTATIVES OF THE STATE OF MONTANA RESPECTFULLY REQUESTING THE PRESIDENT AND THE CONGRESS OF THESE UNITED STATES TO MAKE AVAILABLE ADDITIONAL MONEYS AND MANPOWER FOR PREDATOR CONTROL RESEARCH.

WHEREAS, the livestock industry of the state of Montana is an essential industry that provides meaningful moneys and employment to Montanans, and

WHEREAS, the livestock industry is affected adversely by coyote depredation and other factors such as disease, weather and prices, and

WHEREAS, depredation is extremely difficult to control, and

WHEREAS, Montana is committed to the preservation of our environment for future generations, and to prevention of depredation with minimal adverse effect upon the environment, and

WHEREAS, with the present lack of sufficient knowledge the control of predators remains extremely controversial which makes solutions difficult to obtain, and

WHEREAS, the state's advisory council on rodents and rabid skunks having reviewed the predator problem recommends, and the legislature concurs, that the most reasonable approach to this difficult problem is to carry out basic research on predators on the national level.

NOW, THEREFORE, BE IT RESOLVED BY THE SENATE AND THE HOUSE OF REPRESENTATIVES OF THE STATE OF MONTANA:

That Montana respectfully requests the president and congress to make available additional moneys and manpower for predator control research, and

BE IT FURTHER RESOLVED, that Montana requests the president and congress to support this resolution and continue to support basic research on predators directed at resolving environmental and economic considerations, and

BE IT FURTHER RESOLVED, that Montana recommends that these research funds be utilized in establishing methods for determining and evaluating:

(1) predator-prey population dynamics,

(2) predator-prey relationships,

(3) predator damage assessments,

(4) depredation control,

(5) related social economic data, and

(6) management practices of livestock industries, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent by the secretary of state of Montana to the president of these United States and to the congress through Montana's appropriate delegates, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent to the governor for his review and support, and

BE IT FURTHER RESOLVED, that the governor may use this resolution to enlist the support of other states.

DOCUMENT #16

SENATE JOINT RESOLUTION NO. 26

A JOINT RESOLUTION OF THE SENATE AND THE HOUSE OF REPRESENTATIVES OF THE STATE OF MONTANA RESPECTFULLY REQUESTING THE CONGRESS AND THE PRESIDENT OF THESE UNITED STATES TO ESTABLISH A NATIONAL RABIES WIDLIFE RESEARCH PROGRAM TO PROVIDE PROTECTION TO THE CITIZENS OF MONTANA AND OTHER STATES.

WHEREAS, the state of Montana has experienced wildlife rabies for many years and expects to continue experiencing wildlife rabies in the future, and

WHEREAS, the exposure of Montana citizens directly to wildlife rabies subjects these individuals to a traumatic experience of fear for life and the ordeal of receiving antirabies inoculations, and

WHEREAS, communities experiencing wildlife rabies make demands to state and local governments for control measures which may or may not alleviate the problem, and

WHEREAS, wildlife rabies is transmissible to domestic livestock and results in economic losses, and

WHEREAS, when skunk rabies occurs, Montana has carried out selective skunk populations suppression programs the results of which remain subject to many varying opinions and interpretations as to their effectiveness, and

WHEREAS, rabies in wildlife is a problem that involves several agencies of government making it difficult to define primary responsibility and coordination and cooperation between agencies is necessary for adequate solution of the problem, and

WHEREAS, rabies in wildlife is a problem common to many of the contiguous states, Alaska and Canada and respects no political or administrative boundaries, and

WHEREAS, the department of agriculture's advisory council on rodents and rabid skunks having made a comprehensive review of rabies in wildlife find that more research is needed to obtain information to protect man and lifestock from wildlife rabies:

(1) More information is needed on the epidemiology of wildlife rabies.

(2) More information is needed on the ecology of vector species having a high incidence of rabies.

(3) More effective, ecologically sound control measures must be developed.

(4) Finally, the council recommended that such studies should be initiated and coordinated by the federal government to provide for a standardized rational rabies control program.

NOW, THEREFORE, BE IT RESOLVED BY THE SENATE AND THE HOUSE OF REPRESENTATIVES OF THE STATE OF MONTANA:

That Montana respectfully requests the congress and president of the United States to provide the necessary manpower and funds to implement a national research effort on rabies and its control in wildlife, and

BE IT FURTHER RESOLVED, that Montana is desirous of establishing animal control programs based upon scientific findings which do not adversely affect our environment but provide the methods to protect man and lifestock from wildlife rabies, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent by the secretary of state of Montana to the United States congress through Montana's appropriate delegates and to the president of the United States, and

BE IT FURTHER RESOLVED, that a copy of this resolution be sent to the governor for his review and possible use in establishing programs to protect and assist the citizens of Montana, and

BE IT FURTHER RESOLVED, that the governor at his discretion may forward this resolution to other states for their review to establish and coordinate similar programs among states to achieve the purpose of this resolution.

DOCUMENT #17

SENATE BILL NO. 335

INTRODUCED BY _____

A BILL FOR AN ACT ENTITLED: "AN ACT CREATING A STATE RODENT, RABID SKUNK AND PREDATOR DEVALUATION PROGRAM IN THE DEPARTMENT OF LIVESTOCK TO INVESTIGATE, REVIEW AND EVALUATE RODENTS AND PREDATORS OF ECONOMIC AND PUBLIC HEALTH CONCERN AND TO RECOMMEND METHODS OF EFFECTIVE CONTROL HAVING THE LEAST ADVERSE EFFECT ON MONTANA'S ENVIRONMENT."

BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF THE STATE OF MONTANA:

Section 1. The state of Montana, especially its agricultural and livestock industries, continues to experience economic damages from rodents and predators and the state's citizens continue to be exposed to wildlife rabies. The state, while experiencing these problems and carrying out control programs, has limited knowledge on the distribution, population levels, actual economic damages and ecology of the various species involved. Without a thorough understanding of these factors and others, the state cannot adequately justify control programs and present techniques of control. Therefore, it is necessary to investigate, review and evaluate rodents and predators of economic and public health significance in order to establish rational and effective recommendations for control, while

protecting our environment.

Section 2. A state rodent and predator evaluation program is created within the department of livestock. The department of livestock is instructed to employ a team of specialists, contingent upon legislative appropriations, to accomplish the evaluation objectives set forth in section 3 of this act. The evaluation program will involve only those animal species of economic or public health significance such as the columbian and richardson ground squirrels, pocket gophers, prairie dogs, meadow mice, rats, skunks, coyotes and other rodent or predator species of economic or public health significance.

Section 3. The department of livestock shall through its evaluation team specialists investigate, review, evaluate and report findings on the subjects set forth within this section. These evaluations shall be accomplished only in regard to the species set forth in section 2:

(1) determine the distribution of rodents in Montana;

(2) determine relative population densities of rodents and predators in the various ecosystems of the state;

(3) determine the relationship between land use and rodent-predator problems;

(4) determine the type and degree of socio-economic damage experienced;

(5) recommend the type of controls that may be utilized in the various ecosystems per species within the state;

(6) determine where control is not necessary or where controls should not be implemented because of significant human health and/or environmental concerns;

(7) evaluate the effectiveness of chemical and nonchemical control methods and programs;

(8) determine whether potential and/or actual nontarget and secondary species are being affected by the use of toxicants or other control techniques;

(9) include three areas -- economic losses, public health and protection of Montana's environment;

(10) the evaluation team shall not become directly involved with any control program in the state because of the potential of changing program priorities from evaluation to control;

(11) the evaluation team shall prepare an annual report of its activities, evaluations and findings to the governor, legislature and appropriate state agencies in addition to preparing information for the governor's annual report;

(12) the evaluation team shall establish cooperative programs with any local, state or federal agency that can assist in the evaluation program or increase the effectiveness of the team;

(13) the evaluation team shall explore sources of private, state and federal funds to carry out research in these areas.

Section 4. The personnel to be employed shall have the following qualifications; (1) "Team leader" shall have a Ph.D. or a M.S. degree with five (5) years' experience in one of the biological

sciences.

(2) "Assistant biologist" shall have an M.S. degree or B.S. degree in one of the biological sciences.

The legislature directs the department of livestock, insofar as possible, to employ an interdisciplinary team of individuals knowledgeable in the following areas; environment, ecology, mammalogy, range and agricultural management practices and other scientifically related fields.

Section 5. The department of livestock shall appoint an advisory council which shall terminate July 1, 1975. In subsequent years, the department may appoint advisory councils as needed. The advisory council shall not exceed five (5) members and shall represent agriculture, health, livestock and wildlife. One (1) member shall be appointed at large.

The advisory council may assist the director of the department of livestock in:

(1) formulating evaluation team policy;

(2) employing qualified personnel;

(3) establishing program objectives and priorities;

(4) reviewing results of the evaluation team; and

(5) providing any other assistance requested.

-End-

DOCUMENT #18

SENATE BILL NO. 342

INTRODUCED BY _____

A BILL FOR AN ACT ENTITLED: " AN ACT APPROPRIATING MONEYS TO THE DEPARTMENT OF LIVESTOCK FROM THE GENERAL FUND TO CREATE A RODENT AND PREDATOR EVALUATION PROGRAM. "

BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF THE STATE OF MONTANA:

Section 1. For the biennium, there is appropriated from the general fund the sum of one hundred thirty thousand dollars ($130,000) to the department of livestock to create a rodent and predator evaluation program to investigate, review and evaluate rodents and predators of economic and public health significance in order to establish rational and effective recommendations for their control while protecting the environment.

-End-